

Natural light and artificial light

Defining Natural and Artificial Light

To begin, let's clarify the definitions of natural and artificial lighting. To keep things simple, natural lighting can also be thought of as available light, such as that produced by the sun or the moon. Artificial lighting is produced via another source, such as a studio strobe, speedlight, LED light, your camera's pop-up flash, or even a streetlight or lamp.

Benefits of Using Natural Light

The biggest benefits of using natural lighting is that it is free, abundant, and very easy to find. There's no need to make huge investments in lighting equipment to find gorgeous natural light to pull off brilliant shots. All you need is a camera and some sun or moonlight, and you can begin shooting immediately! If you ever choose to upgrade your natural lighting approach, the tools of the trade are also very cheap, consisting mainly of reflectors and diffusers to bounce or manipulate the available light. Due to the ease of use and acquisition of natural lighting, it's generally recommended that beginning photographers start experimenting with natural light before introducing artificial light to help understand how light works.

Cons of Using Natural Light

While natural lighting is abundant and easy to incorporate into photography, it can be challenging for the simple fact that sunlight varies greatly. Depending on location, season, weather, and time of the day, natural lighting can produce differing colors and contrast in your images. For example, midday sun tends to produce neutral white colors and extremely high contrast, while golden hours of sunrise and sunset have very warm colors and medium contrast. Thus, the look you're going for will determine the time and location of your photo shoot, unless you harness additional tools such as reflectors, diffusers, and lens filters.

Benefits of Using Artificial Light

If you're a fan of being able to manipulate and control every aspect of your photo shoot, artificial light will better suit your needs. Since artificial lighting has little to do with natural sources, it is a ceaseless light source that is available at any time of the day, meaning you don't necessarily have to plan your photo shoot around the weather, or availability of sunlight. Depending on the artificial light source you choose, sunlight or even moonlight can be replicated, creating images that appear to have been shot with natural light, but at a time of your choosing.

natural light and artificial light cont

While artificial light may have a reputation for sounding complicated and expensive, there's a wide range of lighting gadgets available for photographers; ranging from cheap DIY solutions to top-of-the-line professional grade strobes, and lots of options in between. Some lights can have tricky settings, but many are relatively straightforward, especially continuous lighting sources such as LED lights that have simple dimming switches.

Cons of Using Artificial Light

Even though artificial light sources offer you more control over photo shoots, it comes with the burden of needing more gear, and time to set it all up. Unlike the sun, artificial lighting costs money, even if you opt for DIY solutions such as candles or desk lamps. Professional grade artificial lighting sources will also need to be held in place with light stands, and possibly even modified with umbrellas, beauty dishes, and soft boxes.

Depending on the photo you have in mind, you may need multiple artificial light sources to balance your image out. There are also other accessories needed such as batteries or power cables and plugs and you'll need a dedicated studio or space to set your lights up. Long story short, artificial lighting can add lots of extra moving parts to your photo shoot, that cost additional time and money, not to mention require lots of practice.

When to use Natural or Artificial Lighting?

What type of lighting you use will ultimately come down to your personal preference and experience as a photographer, as well as your budget and the ideal image you're trying to create. Artificial lighting typically takes some time and practice to begin using properly; whereas natural lighting is much easier to get started with from the get-go. There are of course exceptions to these rules, but generally natural lighting is usually easiest to use for documentary, street, or run-and-gun photography when you don't have a lot of time to set up a controlled photo shoot. On the flip side, artificial lighting is usually preferred for commercial, product, and fashion photography when there's both a budget, and ample resources to create the photo.

reflection of light

Reflection of the light

Reflection is when light bounces off an object. If the surface is smooth and shiny, like glass, water or polished metal, the light will reflect at the same angle as it hit the surface. This is called specular reflection.

Types of reflection

Light reflects from a smooth surface at the same angle as it hits the surface. For a smooth surface, reflected light rays travel in the same direction. This is called specular reflection. For a rough surface, reflected light rays scatter in all directions. This is called diffuse reflection.

Diffuse reflection is when light hits an object and reflects in lots of different directions. This happens when the surface is rough. Most of the things we see are because light from a source has reflected off it.

For example, if you look at a bird, light has reflected off that bird and travelled in nearly all directions. If some of that light enters your eyes, it hits the retina at the back of your eyes. An electrical signal is passed to your brain, and your brain interprets the signals as an image.

Specular reflection

Lake reflection

photo of Lake Matheson shows specular reflection in the water of the lake with reflected images of Aoraki/Mt Cook (left) and Mt Tasman (right). The very still lake water provides a perfectly smooth surface for this to occur.

The angle at which light hits a reflecting surface is called the angle of incidence, and the angle at which light bounces off a reflecting surface is called the angle of reflection

If you want to measure these angles, imagine a perfectly straight line at a right angle to the reflective surface (this imaginary line is called 'normal'). If you measure the angle of incidence and the angle of reflection against the normal, the angle of incidence is exactly the same as the angle of reflection. With a flat mirror, it is easy to show that the angle of reflection is the same as the angle of incidence.

Water is also a reflective surface. When the water in a lake or sea is very still, the reflection of the landscape is perfect, because the reflecting surface is very flat. However, if there are ripples or waves in the water, the reflection becomes distorted. This is because the reflecting surface is no longer flat and may have humps and troughs caused by the wind.

reflection of light cont..

Concave mirror

When parallel light rays hit a concave mirror they reflect inwards towards a focal point (F). Each individual ray is still reflecting at the same angle as it hits that small part of the surface.

The inside curve of a spoon is an example of a concave mirror

Concave mirrors are used in certain types of astronomical telescopes called reflecting telescopes. The mirrors condense lots of light from faint sources in space onto a much smaller viewing area and allow the viewer to see far away objects and events in space that would be invisible to the naked eye.

Light rays travel towards the mirror in a straight line and are reflected inwards to meet at a point called the focal point.

Concave mirrors are useful for make-up mirrors because they can make things seem larger. This concave shape is also useful for car headlights and satellite dishes.

Convex mirrors

Convex mirror

When parallel light rays hit a convex mirror they reflect outwards and travel directly away from an imaginary focal point (F). Each individual ray is still reflecting at the same angle as it hits that small part of the surface.

Convex mirrors curve outwards, like the outside of a balloon.

Parallel rays of light strike the mirror and are reflected outwards. If imaginary lines are traced back, they appear to come from a focal point behind the mirror.

Convex mirrors are useful for shop security and rear-view mirrors on vehicles because they give a wider field of vision.

Investigating reflection

In this activity, students investigate specular and diffuse reflection by looking into a dark box and shining a torch at various objects, coloured paper and a mirror. By the end of this activity ...

Pinhole cameras and eyes

In this activity, students make a pinhole camera and see images formed on an internal screen. They then use a lens and see brighter and sharper images. This models the human eye. By the end of ...

Indoor lighting

Indoor lighting

Three-point lighting is a standard indoor photography lighting technique commonly used in photography or videography.

3-Point Lighting

1. Key Light

In a completely dark room, the key light will be the primary source of light used to illuminate your subject. The key light acts as a spotlight, taking the place of the sun or a window. Normally, it is the strongest/brightest light in your scene and, as a result, will cast the darkest shadows and have the biggest impact on the look of your scene. Place the key light between 15 to 45 degrees to one side of your subject, either left or right depending on your preference. This will ensure that one side is illuminated while the other is cast in shadow. Consider using a swing arm wall light as the key light in your next photo shoot.

2. Fill Light

Unless you want to photograph your subject in as little light as possible, the next light you will add to your scene will be the fill light. The fill light lends more light to your scene, makes your subject more visible, and softens the light emitted from the key light. This secondary light should generally be placed on the opposite side of the key light.

3. Back Light

Unsurprisingly, the back light is placed behind your subject, illuminating it from the back. The purpose of the backlight is not to add light like the key and fill light, but rather to separate your subject from the background and lend it definition by creating a bright outline around your subject, highlighting it and giving it a 3-dimensional appearance.

Equipments of outdoor lighting photography

1. Scrim

If you can only have one outdoor lighting modifier, make it a scrim. This translucent piece of fabric stretched on a frame is sometimes called diffusion or simply a silk. The more opaque the material, the more diffuse the light will be—and the more light will be eliminated. Available in many sizes, from small pop-up designs like the Manfrotto 24-inch circular collapsible diffuser to large 6×6, 8×8 and even larger designs, the larger a scrim, the more versatile it is. But with size comes increased demand for stands, supports and assistance. The Westcott 48×72-inch Illuminator diffuser is big enough to easily cover most portrait subjects, while compact and light enough to be manageable by a photographer working solo. The whole point of a scrim is to place it between the subject and the sun in order to soften harsh light and create a beautiful, diffuse illumination that's perfect for portraits. At minimum, it decreases contrast and avoids the pitfalls of hot spots and uneven lighting, while at best it looks like the most beautiful studio light you can imagine. Better still, in situations where the natural sunlight is already diffused, the scrim can instantly turn into a reflector. Since it can do this double duty, it's easily the first piece in the outdoor studio equipment puzzle.

In this scenario, on a lightly overcast day, the sun peeking through the clouds creates a bit of a hot spot on Swetha's cheek and nose. On a bright sunny day, this contrast would be amplified and render the portrait practically unusable.

Here, a scrim is positioned between the subject and the sun to take the edge off the hard-edged specular light.

I have a 6-foot scrim that's plenty big for photographing individuals, and I can even use it when photographing small groups of two or three. Simply place the silk between the sun and your subject, in approximately the same position you might place a softbox in the studio. You can even angle the scrim horizontally or vertically to help shape the light further. Without getting that particular, though, simply placing the scrim above the subject in order to cast a shadow from the sun will go a long way toward creating much prettier portrait lighting. In this image, Swetha is positioned in open shade with her back to the sun. A white card reflector is positioned just out of frame to the left, where it can reflect bright sunlight back into the scene, becoming a strong, soft key light. In this scenario, the model is standing in open shade near a stand of trees to camera-right. A subtle

shadow can be seen on her left cheek, while the open sky to camera left provides the beautiful, diffuse main light that's so desirable in portraits.

2.Reflector

Frequently when you see people working outdoors, they have a helping hand holding a reflector. In some cases, this reflector is actually turned into a key light source, while in others it's just providing a bit of fill. In any case, a reflector should be one of the primary purchases when outfitting an outdoor studio. These reflectors can be compact, collapsible units like the many offerings from Lastolite and Westcott. The best thing about these collapsible reflectors is not only do they break down small enough to fit in a shoulder bag, but they also frequently come in three-in-one and five-in-one designs. These multi-format reflectors may start with a diffusion scrim on a frame with a zip-off reversible reflector that's white on one side and silver on the other; then, when reversed inside out, it's gold on one side and perhaps a black flag on the other. The Lastolite Tri Flip Reflector Kit is one such versatile reflector, with the nice bonus of a grip handle that makes it easy for a photographer or an assistant to handhold the reflector in the perfect position.

Interchangeable light modifiers

Different surfaces reflect light differently. White is the most diffuse, least-powerful reflector. Matte silver is still neutral in color but with more reflective power than white. Shiny silver can be practically mirrorlike in its power. A gold reflector warms up the light, and it's great for portraits, especially in the late evening when the sun is near the horizon and the light glows gold already. (Under normal conditions, the warm gold reflector must be used sparingly to prevent the over-warming of the subject, thanks to the gold reflector.) Some folks use an actual mirror when they want to reflect a ton of sunlight onto a subject, but this is generally for use as a background light, backlight or hair light. A true mirrored surface will maintain the specular nature of the sunlight that's hitting it, making it impractically harsh for most typical key and fill uses. In the film production world, a "shiny board" is a very nice reflector, perfect for throwing light over long distances. These boards come in sizes such as 2x2 feet and 4x4 feet with a mounting yoke that makes it easy to position the board on a stand and angle it to deliver its reflection precisely where you want it. These, too, come in various surface finishes such as shiny silver and matte silver.

The first thing to look for when working outdoors and making portraits is open shade. These are areas where direct sunlight doesn't illuminate but rather the reflected light from open sky is able to illuminate the subject with diffuse yet directional light. Ideal examples of open shade are just inside doorways, under overhangs or beneath the canopy of tall trees. To be clear, you're not looking

for dense shade but rather an area where there's plenty of light reflected from open sky, but where direct sunlight isn't striking. In these situations, even the unmodified light is appealing on faces. With a bit of fill from a white card, however, you've really got some world-class beautiful light on your hands. You can use a white card for subtle fill or a silver card to kick in even more light. A gold reflector does a nice job of adding warmth, much like a hint of magic-hour lighting, which looks great as long as it's not overdone.

3.Flag

A black fabric flag—or even a piece of black foamcore—can come in tremendously handy for shaping light outdoors. If your key light is omnidirectional, for instance, and you'd like to help give it some directionality, placing a negative fill from a flag on one side of the subject helps create a shadow there and gives shape and direction to the lighting. Flags are also ideal when shooting toward the sun, particularly when it's near the horizon. You can place a flag on a stand just above the frame of your composition to prevent flare, or you can use flags to physically create shadows and shape the light on the subject just as you would in studio. These, too, typically require a stand and/or a helping hand.

The most obvious use of a black flag when working outdoors is to fight lens flare—just as you would in the studio. Place it just out of frame between your lens and the sun, and you'll keep flare from sapping sharpness, color and contrast. But while this is one of the most obvious uses, it's not the only use—or even the best. I love to use a black flag outdoors as negative fill—a light modifier that

prevents light from striking the subject from every direction. Simply positioning a black flag just out of frame and close to one side of the subject does wonders for the dimensionality of the lighting. Now, instead of coming from everywhere, the light is coming from a distinct position. This allows you to pose and reposition your subject in order to create attractive lighting patterns on their face. It's a great way to step up your game compared to normal, everyday “cloudy sky” lighting that isn't very nuanced at all. Oh, and instead of investing in black flags on frames, you can always use sheets of black foamcore for a light, durable and functional flag, which is particularly helpful when working outdoors. I frequently take 4x8 black V-flats outside for this very purpose.

4.Speedlight Flash

Although it makes the most sense to work with beautiful natural light whenever possible, a handheld flash such as the Nikon SB-5000 AF Speedlight or the Canon 600EX II-RT opens up a whole world of outdoor portrait lighting techniques. For instance, the flash mounted atop the camera can provide the perfect frontal fill in bright sunlight when the sun is positioned at the subject's back. Or, with the flash off-camera and mounted to a stand positioned above and behind the subject, you can create depth with a hair light or edge light separating the subject from a dark background. You can also make that little strobe a big, beautiful key light by bouncing it off of a reflector or simulate sunset light by positioning it at a low angle and gelling it orange to emulate the warm glow of magic hour light. For the relatively small amount of real estate a strobe occupies in a camera bag, it delivers exceptional bang for its buck in an outdoor studio.

When photographing a portrait subject on a sunny day, your first choice is to determine which direction they should face. Put the sun at your back, and the subjects will be squinting uncomfortably. Put the sun at their back, and you'll be shooting into it, increasing the chances of underexposing the subject, overexposing the background, and generally producing an uninteresting, low-contrast and low-saturation shot. Instead, with the sun behind your subject, you can use an on-camera flash as a new key light. I frequently use this technique by starting with a slightly underexposed ambiance (instead of 1/125th and f/11 at ISO 100, for instance, I might start at 1/250th or by stopping down to f/16) and then using my flash to illuminate the underexposed face. This way, I'm assured a rich, vibrant background without the blown-out overexposure that might come from a normal daylight exposure, and I can control that ratio simply by powering my flash up or down. The frontal flash won't be particularly attractive in this setup as described, however, so consider bouncing the flash to a large white reflector or shooting it through a scrim in order to create the type of diffused, soft key light that an umbrella or softbox would accomplish in studio.

A slightly more specialized use of an off-camera flash is to use it to emulate beautiful warm sunset light by positioning it on a stand at the subject's eye level. This is, after all, where the sun is positioned at the golden hour of sunset. With a CTO (color temperature orange) gel on the flash, you'll get warm sunset light from an otherwise unmodified flash. Try to position the subject out of direct sunlight in order to ensure you're not dealing with competing shadows, and underexpose the

5. Stands And Sandbags

When working outdoors, a light stand is absolutely no good if you're not going to weigh it down with sandbags. On even the calmest days, a hint of wind can send your rig sailing. So instead of risking injury to yourself, your crew or your subject, thoughtful photographers weigh down their stands with heavy sandbags to keep them from moving. An ideal amount of sandbags is two more than you think are necessary. In the studio, a single sandbag may be plenty to help lower the center of gravity on a light stand, but outdoors each stand deserves at least three sandbags. If the stand and/or the lights are particularly big, more sandbags are necessary. Better still is to recruit some human help along with the stands in order to maintain the status quo of safety on your set. As for the stands themselves, American Grip and Matthews Studio C-stands are, of course, a great choice for holding lights as well as booming scrims and other modifiers outdoors. You can also consider something like Manfrotto's 13-foot tall Combi-Boom Stand. These stands are perfect for getting the light out over the scene whether you're using a light, a reflector or a diffuser.

When working outdoors, a stand-alone is no good. I find that while a single 15-pound sandbag might be enough in studio, outdoors I prefer at least three for a stand holding a light, and four, five or even more sandbags for a stand that's holding a large modifier that the slightest breeze is more likely to turn into a sail. A film production crew member once told me this is the biggest difference he sees between photo shoots and television or movie productions: The photographers rarely use enough sandbags outdoors. These things can be quite dangerous, so don't mess around. Use more sandbags than you think you need.