

## Lighting Basics

John Metcalfe Photog. Cr.,CPP

### Characteristics of Photography

One of the basic characteristics of photography is to create depth and a three dimensional image on a two dimensional piece of paper.

Colors, tones, highlights & shadows are what we have to work with.

Since it is necessary to give shape to the face and have a long tonal range, it is essential to position the head and face in a manner to allow shading and shape to be portrayed.

In order to place the head on a two dimensional piece of paper, and give the appearance of three dimensions, each plane of the face should be illuminated at a different intensity.

The purpose is in fact, different sides and planes of the head.

The placement of shadows is equally as important as the highlights.

The easiest way is to reveal only two sides of the head to the camera.

By turning the face into the light, it is very easy to illuminate the mask of the face and create beautiful contouring shadows on the side closest to the camera.

This will slim the face and is generally the most flattering light.

### Main Light

Making a photograph with available light is relatively easy.

You take the light you are given and observe what is doing to your subject.

But where do you begin with artificial light?

Since the most natural-looking light imitates that from the sun, the place to begin is by positioning the main light.

The main light should create the only visible shadows, or at least the important ones. Two or three equally bright lights produce multiple shadows and create artificiality and confusion.

The position of the main light affects the appearance of texture and volume.

Flat lighting decreases texture and volume, while light that rakes across a surface increases it.

Natural light usually comes from above the subject, so that is the most common position for the main light.

Most photographs made with artificial light employ more than one light source.

### Different types of light

Front Lighting:

With the light placed as near to the lens axis as possible, only thin shadows are visible. This axis lighting flattens out volume and minimizes texture.

#### Side or Hatchet Lighting:

The light is at subject level, directly to the side. It is sometimes called hatchet lighting because it splits the image in half. This type of lighting really emphasizes facial features.

#### High Side Lighting:

A main light at about 45 degrees to one side & 45 degrees above the subject has long been the classic angle for portrait lighting, it seems natural and flattering. It models the face into a three-dimensional form.

#### Top Lighting:

A light almost directly above the subject creates deep shadows in the eye sockets, under the nose and chin. The effect is often made outdoors at noon when the sun is overhead.

#### Under Lighting:

Light from below produces odd-looking shadows because light in nature seldom comes from below.

Firelight is one source. High-tech scenes such as by a computer monitor, are a modern setting from under lighting.

#### Back Lighting:

A light pointing at the back of the subject outlines its shape with a rim of light like a halo. Be careful to position a back light so it doesn't shine into the camera lens, fogging the film and so the fixture itself is not visible.

### Types of Light

#### Photofloods:

Like a household bulb, but produces more light.

#### Quartz-halogen bulbs:

Like the photo-flood, but contains a gas to prolong life, and are color balanced for indoor films.

#### Floodlight:

Could be any type of light which spreads its beam over a wide angle.

#### Spotlight:

Same as the floodlight, but has a lens in its housing that focuses the light into a concentrated beam.

#### Barebulb:

Even though a small light source with defined shadows, the bare bulb allows the light to reflect in every direction, filling the area with light.

### Reflectors & Light Control Devices

#### Bowl-shaped reflectors:

Used to direct the light toward the subject.

#### Snoot:

Is a tube attached to the front of the lamp to narrow its beam.

#### Reflector Flat:

Material used to reflect light back to the subject.

Umbrella Reflector:  
Used to produce a wide diffused light.

Gobo:  
A panel used to shade, either some part of the subject or camera.

Barn doors:  
A set of panels mounted on the light source. They can be folded at different angles to block part of the lights illumination.

\*\*\*\*\* Diffusers & Filters\*\*\*\*\*

Diffusion screen:  
Often a translucent plastic, used to soften light & make shadows less distinct.

Lightbox or Softbox:  
Completely encloses one or more lamps and produces a soft even light.

Filter holder and gels:  
Attached to the front of a strobe. It can change the color, diffuse or use polarizing screens that can remove glare.

## Controlling the light

The size of the light source and specularly changes the effect on the subject.

The smaller the light source is the more defined the light.

Example: the sun is a small light source.

On a clear day the light is very harsh, creating strong shadows. On an overcast day the light is diffused by the clouds, creating a large light source and subsequently softer shadows.

The closer the light source is to the subject the softer the light. This is because the light source is getting larger.

Feather the light. This means to use the edge of the light. The edge of the light is sharper and more defined. Also while feathering your light you are keeping the light from spilling into other areas, like the background.

This allows the background to grow darker, and it takes away any shadows that might hit the background. And if you had a colored gel on the background it would become brighter and more vibrant.

## The Fill Light: To Lighten Shadows

When you look at a scene, your eye adjusts to the differences in brightness: as you glance from bright to a dark area, your pupil opens to let in more light.

But the camera's sensors do not work the same way. It can only record a limited range of tones. If you expose highlights correctly in a high contrast scene, shadows will be very dark; if shadows are properly exposed, highlights will be very light.

A fill light is one solution for adding light to shadow areas, reducing contrast and bringing out

details that would otherwise be lost.

A reflector is a simple, effective way to fill light. Bouncing the main light into areas where it is needed.

A flood light or flash can also be used for fill lighting.

A light source used as a fill is generally placed close to the lens so that secondary shadows will not be visible. It should be made non-directional, plus by keeping the fill on the same side as the main you eliminate any secondary shadows.

The fill is not usually intended to eliminate the shadow altogether, so it is normally of less intensity than the main light.

It can have lower output than the main light, be placed farther away from the subject, or have a translucent diffusion screen placed in front of it.

A black reflector is useful at times. It is a sort of anti-fill that absorbs light and prevents it from reaching the subject.

You can roughly judge how dark your shadows are by squinting while looking at the scene or by viewing the scene through the camera with the lens stopped down. This makes the shadow areas appear darker and thus more noticeable.

But the best way is to measure the light with an exposure meter.

If important shadow areas, like the shadow side of the face, measure 3 or 4 stops darker than the midtones, they will be very dark or even black in a print.

Color transparencies & digital images need fill light even more. As little as 2 stops difference between highlights and shadows can make shadows look very dark.

## Ratios

Difference between the lit side of a subject and the shadow side is sometimes given as a ratio. The higher the ratio is, the greater the contrast.

A 1:1 ratio means, the lit side is no lighter than the shadow side, in fact there are no significant shadows.

A 2:1 ratio means the lit side is twice as light as the shadow side (a one stop difference between meter readings for each side), which will make shadows visible but very light.

A 4:1 ratio (with the lit side four times - 2 stops lighter than the shadow side) will render the shadows darker, but still show texture and detail in them.

At 8:1 (lit side 3 steps brighter than shadows) or higher ratio, some detail is likely to be lost in highlights, shadows, or both.

Portraits are conventionally made at a 3:1 or 4:1 ratio, with the lit side between 1 1/2 and 2 stops lighter than the shadow side.

To measure the lighting ratio, meter the lit side, then shadow side, and count the number of stops difference between them.

## Multiple-Light Portrait set-Ups

Conventional portrait lighting is realistic but flattering.

These lighting setups model most faces in a pleasing manner and can be used to improve some features.

A typical studio portrait uses a moderately long camera lens so that the subject can be placed at least 6 feet from the camera. This avoids the distortion that would be caused by having the camera too close to the subject.

The subject's head is often positioned at a slight angle to the camera turned just enough to hide one ear.

Short Lighting - Places the main light on the side of the face away from the camera. This is the most common lighting, used with average oval faces as well as to thin down a too-round face.

Broad Lighting - Places the main light on the side of the face toward the camera. This type of light tends to widen the features, so it is used mainly thin or narrow faces.

Butterfly Lighting - Is conventionally used as glamour lighting. The main light is placed directly in front of the face, positioned high enough to create a symmetrical shadow under the nose but not so high that the upper lip or eye sockets are excessively shadowed.

The fill light is close to the camera lens. Since it is farther away than the main light, it lightens but does not eliminate the shadows from the main light.

The back light is set behind the subject out of sight directed back toward the lens creating a halo effect.

(Angle of reflection rule)

The hair light is placed high behind the subject, shining toward the camera but not in the lens. It rakes across the hair to emphasize texture and bring out sheen. Notice: Set it at the same setting as the main and make sure you isolate your light on the hair keeping it from spilling into other areas.

The background light helps separate the subject from the background.

The accent light rakes across the image adding more contrast and volume to the image. Notice: Set it one stop less than the main and do not let the accent light reach the shadow side of the face.

## A Portrait Subject

A portrait photographer should understand that their primary objective is to idealize their subject. The techniques of improving the subject's appearance through posing lighting, and camera angle should be used when necessary and possible. In many instances, more than one of the following suggestions will have to be employed. You must evaluate each subject individually and decide what your total corrective treatments should be.

Prominent Forehead - Tilt chin upward, lower camera position, use gobo (head screen), use barn doors.

Long Nose - Tilt chin upward, face directly toward lens, lower main light, lower camera angle.

Narrow Chin - Tilt chin upward, lower camera position, use 3/4 head position.

Baldness - Use gobo to shield top of head, use no hair light, blend top of head with background.

Angular Nose - Turn face towards camera, place main light to produce a straight line.

Broad or Round Face - Use short lighting, turn face to 3/4 position.

Narrow Face - Use broad lighting, use umbrella or turn face towards camera.

Wrinkled Face - Use soft lighting, use feathered light, a relaxed non-smiling pose, use a high camera position.

Double Chin - Tilt chin upward, body straight and leaning forward, use a high camera position.

Facial Blemishes, Scars, etc. - Use diffused lighting, place blemishes, scars, etc. on the shadow side of the face if possible.

Ears - Show only one ear.

Prominent Ears - Hide far behind head, keep near ear in the shadow.

Glasses - Tilt lenses downward by raising the glasses stems, have subject raise or lower chin.

Deep-Set Eyes - Lower main light, use lower light ratio.

Pop Eyes - Lower camera angle, talk to subject from camera position.

Droopy Eyelids - Have subject look up, put catch light in eyes.