

## PRINCIPLES OF LIGHT:

The use of a light meter and grey card will facilitate your measurement of the amount of light illuminating your subject. However, the quality of light as determined by the angle, direction, and contrast can only be determined through observation and experience. **Look** before you shoot.

To use the reflected light meter point the meter at the subject. Keep the meter parallel to the camera lens plane. You may choose to move in closer to meter off a gray card; be careful not to cast your shadow onto the card.

**Ambient Light:** Avoid shooting in the middle of the day when sunlight is most contrasty. When using natural light, try shooting before 10:00 AM or after 2:00 PM to take advantage of the softer light present at those times of day.

To fill in shadows with contrasty, ambient light, try using a large white card, reflecting light back into the shadows--as in portraiture or landscape.

Take advantage of shaded areas with lots of reflected light or areas partially covered by trees for uneven dappled light patterns.

**Artificial Light:** When working with artificial light, you may need higher wattage...as in tungsten lights or the tota-lights...that are rated over 300 watts.

### 1- LIGHT : ANGLE AND DIRECTION:

The angle of incidence equals the angle of reflection.

The angle of the light can affect the mood of the photograph, especially by altering the shape of shadows.

Light travels in straight lines.

Directions of light: front, side, back, top, bottom

Common positioning of light: top light, side light

The direction of illumination affects perception of volume, contrast, texture and space.

The direction of illumination defines the direction, size and placement of shadows in the photograph.

### 2- MEASURING LIGHT INTENSITY:

Inverse-Square Law: Light from a source changes in intensity proportional to the inverse of the square of the relative distance from the source.

$$\text{Intensity} = \frac{1}{\text{square of distance between object and light source}}$$

i.e.

Doubling the distance will cut the level of illumination by a factor of four

Tripling the distance will cut the level of illumination by nine.

Cutting the distance in half will increase the level of illumination by four times.

### 3-CATEGORIES OF LIGHT:

#### DIRECT:

Direct light is light traveling unimpeded from the light source to the subject, not filtered,

diffused, reflected or altered. Direct light is like full sun on a clear day.

### **REFLECTED:**

Reflected light is light proceeding from a light source and bouncing off a remote surface and reflecting onto an object. Light reflected into an umbrella with a black backing is an example of reflected light. Light can also be reflected off a white wall or a silver or white card and directed toward a subject. Reflected light is less directional than an unimpeded source light.

### **DIFFUSED:**

Diffused light passes through a remote diffusion device or material prior to reaching the subject. Diffuse light is created by clouds or haze in the sky. This light becomes less directional and less contrasty. An example of diffused light is created through the use of a shoot through umbrella. The umbrella acts as a diffuser. Other types of diffusers includes softboxes and translucent white panels.

### **RADIANT:**

A radiant light is a light source that is directly entering a lens such as flare, or a silhouette created by a backlight.

### **4-CONTRAST:**

The contrast of a photograph is determined by a number of factors.

Consider the relationship between the **subject** contrast and the **lighting** contrast resulting in the **scene** contrast (and ultimately the **brightness range** : an F stop range from textured shadows to textured highlights)

#### **I. Consider the relationship between values in the subject:**

A subject such as a chessboard, black and white, has **high contrast**.

A grey cat on a grey rug may have little if any inherent contrast, **low contrast**.

#### **II. Consider the quality of light that illuminates your subject (whether ambient or artificial).**

**Spotlight: direct** The most direct form of light is a spotlight, focussing light of intense illumination to one spot. The spotlight is direct light that does not wrap around forms.

The shadows produced are deep, even, and contrasty. There is **little or no penumbra**; consequently there is a limited description of form or volume.

(Penumbra is the edge of the shadow, the space between the light and the shade, the half-light transition at the edge of darkness).

**Totalights:** The totalights have a reflector behind them, and combine some reflected and directional light. Compared with a light equipped with a large pan reflector, the tota-lights are more directional, and somewhat contrasty. Without a diffuser or bounce umbrella, the tota-light produces a higher light intensity.

**Broadlights: reflected and direct** A broadlight, including both direct and reflected light, wraps around objects due to its less directional nature. It reduces levels of illumination between light and shadow and is moderately contrasty. A broadlight produces a small but noticeable penumbra. Shadows are sharp and even.

#### **Reflected light:** (umbrella with black covering)

Light reflected into an opaque umbrella will be softer than the direct light, the straight totalight, or a broadlight, but more contrasty than the light created with the shoot-thru umbrella or the softlight.

**Shoot-through umbrella: diffused light** The shoot-through umbrella will produce softer, diffused light. The light intensity will be lowered through diffusion.

**Softlights: diffused light** A professional softbox incorporates a diffuser and/or a reflector in the construction of the lighting instrument. The light source is usually large and produces an ill-defined, uneven shadow. The **diffused, directionless** light wraps around the form and produces a **large penumbra**.

#### CONTRASTY LIGHT:

A **smaller light source** provides **more contrast**, and a shadow with a smaller penumbra.

The **farther away** the light is positioned in relationship to the object,  
the **more contrasty** the illumination  
--the shadow becomes **contrasty** with a smaller penumbra.  
--from the object's perspective, a light source positioned far away becomes small, like a spotlight.

#### SOFT LIGHT:

A **larger light source** provides **softer** illumination, and a shadow with a larger penumbra.

The **closer** the light is positioned to the object, the **softer** the illumination  
--the shadow is **softer** with a larger penumbra.  
--from the object's perspective, a light source positioned nearby looms large.

#### 5- BALANCING OUT THE LIGHT:

A single light source can be used; the shadows can be filled with the aid of a reflective card.

This procedure of directing more light to the shadows can be used when working with the sun or with artificial light.

Other examples of balancing light to produce limited contrast include: using both ambient light and artificial light, as in the use of flash fill illumination; or in a studio environment where two or more light sources are used.