Chapter Six

Approaches to Lighting

Lighting is more than simply obtaining adequate exposure. It is a way to direct the viewer’s eye in the frame, and to establish the character, the mood, and the dramatic quality of the image. Lighting can establish the time of day, bring out enhance or mute colors, or create a feeling of safety or danger. Light can be used to emphasize or de-emphasize depth. Layered in planes from the front to the rear of the frame, light can help define the space in three dimensions.

The lighting styles discussed in this chapter are employed while shooting on a set or location.

Lighting Styles

The lighting in most modern dramatic motion pictures tends to be more or less realistic; it looks like the natural light we experience in everyday life (see Figure 6.1a). The key to this style of lighting is that the light must appear to be coming from some real light source in the movie, such as a streetlight, a table lamp, or the sun. This kind of lighting is often called source lighting because it mimics or augments the direction of the light and the light source in the scene.

The opposite lighting approach, one that could be called expressionistic (or stylized), is more concerned with creating a particular mood or feeling in the shot than in seeming realistic (see Figure 6.1b). Such distinctions are not always clear-cut. To produce an image requires light, even in places where light is unlikely. It may be totally unrealistic to have a spotlight illuminating the slimy monster in a dark sewer, but realistic lighting is not the primary objective in such movies. In Steven Spielberg’s War of the Worlds, there is a 17-minute sequence that takes place in a basement at night. Although the setting was one without light, the cinematographer still had light coming between boards and around corners, figuring that the intense nature of the film was such that they could get away with it. -Even motion pictures that make every effort to employ realistic lighting can slip into movie lighting conventions that defy
our experience with light in real life: the pitch-black alley behind the bar that is always lit by a convenient full moon or the light streaming from beneath the dashboard in the front seat of the otherwise dark automobile (see Figure 6.2).

There are many different approaches to lighting. Numerous books and magazines discuss the aesthetics of lighting, but ultimately the style of lighting employed tends to defy any simple formula or rule book. A lighting setup takes into account both the technical limitations of the camera, lens, and recording medium and the dramatic needs of the story.

**Basic Three-Point Lighting**

*Three-point lighting* is perhaps the most traditional approach to lighting. It creates a balanced, sculpted image that emphasizes three-dimensionality in the otherwise flat, two-dimensional film or video frame.

The primary light source in three-point lighting is called the *key light*. The key light simulates the main source of illumination for a scene—the sun (or streetlight) outdoors, a lamp or lighting fixture indoors. It typically is placed 30 to 45 degrees from the camera-to-subject axis and is elevated at an angle of 30 to 45 degrees above the camera-to-subject axis (see Figure 6.3). The key light is often a focusable lighting instrument like a *Fresnel* that is adjusted somewhere in the middle of the flood-to-spotlight range (see Chapter 5). It creates some shadows, giving shape to the subject. As the dominant lighting source, it is the light most responsible for setting the basic *f-stop* used to shoot the scene.

The *fill light* is placed on the opposite side of the camera from the key light, from near the camera to as much as 45 degrees away, and usually at camera height. It fills in, at least to some degree, the shadows created by the key light. For that reason it is never more intense than the key light and almost always employs a softer, more diffused light source, such as a high-frequency fluorescent, LED lamp, or tungsten light in the flood position (see Chapter 5). Too much fill light can create a flat, low-contrast image.
The third basic light in a three-point lighting setup is called the back light. It is placed above and behind the subject at enough of an angle to keep the light from coming directly into the camera lens. The back light helps to outline the subject (particularly in the head and shoulder area because the light is coming from above and behind) and separate it from the background.

Additional lights, sometimes referred to as separation lights, amplify or enhance the modeling provided by traditional three-point lighting (see Figure 6.4). An eyelight is a small, focusable light placed near the camera (at eye level) to add a sparkle to a person’s eyes. A background light illuminates the background, not the back of the subject like a back light does. It helps to separate the performers from the background or set. A kicker light is similar to a back light in function. It is usually placed low, behind the subject, often directly opposite the key light. It also helps to separate, or “kick,” the subject out from the background. The intensity needed for a back light or kicker light can vary greatly. A brunette requires more light, a blonde less, and a bald person even less. A properly lit scene may not even require separation lighting, and some lighting directors avoid kickers and back lights to achieve greater realism.

**Insert Figure 6.4 here.**

### Comparison of Lighting for Film, SDTV, and HDTV

Like many other facets of moviemaking, lighting styles for film and video have merged. This is mainly because the technical characteristics of television cameras have continually improved. Television cameras of the 1950s required a significant amount of light, called the baselight level, just to produce an image. Programs were aired live, usually with three cameras, so lighting had to be designed so it would illuminate the shot regardless of which camera was being used. Generally, light was poured over the entire action area, producing relatively flat, even lighting.

In contrast, the much greater sensitivity of film stock made it far easier for filmmakers to shoot on location with lower light levels and more natural (or realistic) lighting techniques. Film-style lighting grew out of the single-camera shooting method for film: the lighting setup
was changed as the camera position changed for virtually every new shot. This was a slow and tedious process, of course, but what film-style lighting lost in time it made up for in control.

As technological improvements in video equipment began to narrow the differences between film and video, applying film-style lighting techniques to standard definition television (SDTV) production became increasingly possible. With high-definition television (HDTV), the differences between what is needed for film and for video lighting are narrowing even further. Film still has greater **latitude**, or **contrast range**, in that it can reproduce a greater range of brightness levels (from the darkest to brightest points in the scene) than video. This means there will be more details in dark areas and light areas of a frame on film than on video. But the contrast range gap is narrowing with each new model of digital camera.

Shooting movies with video cameras, especially high-definition cameras (see Chapter 3), is relatively new, so cinematographers are experimenting with how best to light with this medium. Sometimes HDTV is too sharp, and unimportant background items can draw the viewer’s attention away from important foreground information. In these cases, the background needs to be more dimly lit than it would be if shooting with film.

The film image is less affected by strong highlights than video because each successive film frame presents an entirely new recording area, unaffected by the previous frame. In a video camera, each frame is scanned from the imaging device, so elements remain with the pixels. Therefore, video may need some type of contrast reduction, such as a **low-contrast filter** (see Chapter 5). Sometimes large, dark areas of a video frame, especially with standard definition, show a great deal of noise. The answer to this problem may be to use fill lighting to bring up the light level in those dark areas.

### Preparing to Light

Lighting, like any other element of the production, requires advance planning. The **lighting director** or **cinematographer** needs to understand the exact nature of the scene being shot. What kind of mood is the director trying to create? What kind of lighting instruments
does that require? Are any special lighting accessories needed? At what time of day is the scene supposed to be taking place (and will the scene actually be shot at that time)?

If you are not going to be shooting in a studio, careful and systematic location scouting is imperative. You will need to survey each location to determine how much light it will require and how lights can be mounted. How many crew members will you need to set up the lights or handle the reflectors? Seeing
Observing the site at the time of day you are actually planning to shoot is important. The position of the sun (and the prevailing lighting conditions) changes dramatically from early morning to late afternoon.

Consider what types of lamps fit the circumstances the best. For example, tungsten lamps are inexpensive and make faces and sets look pleasing, but they also generate a lot of heat and use a great of electricity, so they may not be appropriate if you are shooting in a small room that can not be air-conditioned. Fluorescents use less power and are only lukewarm to touch, but it is harder to control their light beams to make them work effectively as spotlights.

Once you have some idea of what kind and how many lights you are going to need, survey the location for electricity. How much power do you need, and how much is actually available there? This is the time to find the breaker box and map out the power circuits. How many wall outlets do you have, and where are they located? If you need to run power from additional circuits, how long do your extension cables need to be? Do you have a contact person so you can gain access to the breaker box? Do you need to hire a qualified electrician? If the power at the location is inadequate, you will need to rent a generator or perhaps negotiate with people nearby to buy power from them.

You also need to consider how you will transport your lighting equipment. Lights and lighting accessories are large and bulky. They are also fragile. What kind of vehicle do you need to transport the equipment? What kind of access do you have for the vehicle when you reach the location? Ultimately, you will need to develop a checklist so that you don’t forget anything. Here are some of the major items to include:

1. Lighting instruments and spare lamps (number, type, and size)
2. Mounting equipment (number, type, and size)
3. Lighting accessories (barndoors, flags, filters, diffusers, reflectors)
4. Power cables and mats, sandbags, and gaffer tape
5. Generator (if needed)
6. Safety equipment (fire extinguisher, gloves, and such)
7. Transportation
8. A weather report

Outdoor Lighting

Shooting outdoors usually means that you will have enough light to meet the baselight requirements of almost any film stock or electronic imaging system. The sun itself can be a powerful key light, not only defining the time of day (based on the color temperature and angle of the shadows), but also dictating the direction of the light in the scene. Shooting with the light (in the direction the light rays are falling) is the simplest and most common technique for outdoor shooting. Keeping the sun at your back usually eliminates the problems associated with lens flare and backlighting. The photos in Figure 6.5 illustrate shooting with the light and against it.

Light in the early morning or late afternoon casts longer, more clearly defined shadows, creating a greater sense of relief or modeling and a more dramatic image. A shot of a high mountain lake looks quite different in the flat light of midday than early or late in the day. The time of day also affects the color tones in the image. The late afternoon sun casts a particularly warm, golden light. Many cinematographers prize the look of this “golden time” and set up their shooting schedule to take full advantage of the atmosphere it establishes. For similar reasons they have used the dramatic red glow of a sunset as the backdrop for scenes in countless motion pictures.

The quality of the outdoor light we actually experience ranges from very harsh and direct to soft and diffused. In fact, natural light is usually a mixture of different light qualities.
The sun can be both a source of hard direct light and a source of fill as the sun’s light is reflected from clouds, buildings, and the ground to form a softer, more diffused general skylight. In most cases, however, reflected skylight does not provide enough fill for outdoor shooting. Without adequate fill light, a sunlit image can easily exceed the contrast range of a camera’s imaging system. As a result, outdoor lighting usually involves some kind of contrast reduction, a way to reduce the enormous range between bright sunlight and the dark shadows of the shade.

**Contrast Reduction**

Throwing additional fill light into the scene is one way to reduce contrast outdoors. This is why professional film and television companies so commonly use artificial lighting outdoors, even on a bright sunny day. This situation necessitates the use of daylight-balanced light sources such as HMI lights, kinos with 5,500-degree K bulbs, or tungsten-balanced lights converted (with a blue filter) to daylight color temperature.

An even easier and cheaper method of providing daylight-balanced fill light is using reflectors (see Figure 6.6). Reflectors can bounce direct sunlight back into the scene for fill lighting. If the sun is the primary light source in a scene, the reflector will have to be placed in the standard fill light position (on the opposite side of the camera from the key light) to reflect the sunlight into the scene. Reflectors are mounted on stands (or sometimes handheld) above eye level to simulate skylight. If they are too low, or if they create a too clearly defined light pattern, the reflected light they cast can look artificial and unnatural.

Another way to reduce contrast is to suspend a large scrim or light-diffusing medium over the entire set area. This can virtually eliminate shadows, creating soft, dreamy, highly diffused lighting. The same thing can be accomplished simply by shooting in a shaded area or on an overcast day.

Sometimes you can put a filter on the camera to control outdoor lighting conditions. A neutral density filter reduces the overall light level in an excessively bright outdoor scene. This can be helpful when you want to reduce the depth of field by forcing the camera to shoot at a
wider f-stop (see Chapter 3). Polarizing filters minimize unwanted reflections from water or glass. Low-contrast or soft-contrast filters reduce the contrast range. \(^3\)

**<H2>Maintaining Continuity in Changing Light**

When the sun is the primary light source, there is always the potential for lighting-induced **continuity** errors. Movies are usually shot out of sequence, and long delays between camera setups are commonplace. Shots that supposedly occur sequentially in time may have been shot at different times during production, even days or weeks apart. If those shots are to flow together seamlessly in the final motion picture, the lighting within the scene must be consistent from shot to shot. If the first shot takes place in direct sunlight, it will look strange if the light in the next shot is suddenly the more diffused light caused by a passing cloud. Similarly, the direction of the light must be consistent. A shot taken at noon, when the sun is almost directly overhead, contains few shadows. If that shot is followed immediately by a shot that clearly displays the long shadows of late afternoon, the continuity violation is obvious.

Even the natural changes in the sun’s **color temperature** throughout the day can be the source of continuity errors. The color temperature of sunlight at 4 p.m. is visibly different from the color temperature at 6 p.m. (see Color Plate 5). The automatic **white balancing** circuit in a video camera, or **color compensating** filters on a film camera, can correct for these small shifts in color temperature. However, you cannot eliminate gross changes in the shadows or in the overall quality of the light.

The only way to avoid lighting-induced continuity problems is to organize your shooting schedule carefully when working in natural light. Trying to shoot a long, complicated scene late in the day when the light is changing rapidly will almost certainly lead to problems. Group similarly lit scenes together, and try to avoid shooting different sections of the same scene at different times of day.

**<H2>Shooting at Night**

Night scenes abound in feature films. Shooting at night, what filmmakers call...
night-for-night, produces the most convincing results (see Figure 6.7). One of the biggest battles in night lighting is finding a convincing, believable (well-motivated) source—a store window, streetlight, or bright moon—for the illumination of the scene. Artificial lights are then used to simulate the light that would be coming from that source. Night lighting is easier if the actors avoid wearing dark clothing, that which makes them blend into the background.

***Insert Figure 6.7 here.***

Dusk-for-night shooting is just what it sounds like—shooting at dusk. The sky at twilight provides a natural blue fill. Artificial lights provide the key. The biggest problem with dusk-for-night shooting is that twilight is so short. The rapidly changing lighting conditions require constant monitoring and readjustment of lights.

Another method, called day-for-night, is a well-known film technique for shooting “supposed” night scenes during the day. This involves increasing the contrast and darkening the sky, usually by using a deep blue filter for color filming. Some cinematographers use film that is balanced for artificial (3,200-degree) light and shoot without an orange color conversion filter, thus enabling the film to “see” the daylight as blue. The scene is then underexposed by 1.5 to 2.5 f-stops. The film laboratory can also enhance the day-for-night effect during printing. With the proper tinting and some trial and error, many of these night effects are also possible in video. A scene can be made to look more like night if a light blue gel is used on the lighting instrument.

This is because moonlight is conventionally enhanced by a bluish cast.

<H2>Adapting to Weather Conditions</H2>

When shooting outdoors, natural weather conditions can change the quality of the light dramatically. A funeral scene shot on a dark, overcast day reads differently from the same scene shot in bright, cheery sunlight. The highly diffused light of an overcast day often improves a color image. The low-contrast lighting can mute certain colors, making them more subtle and pastel. Shooting just after a rain has stopped can pick up a myriad of reflections and moving water patterns. Snow, fog, and mist each create a distinct mood-provoking atmosphere (see
Figure 6.8). Even extremes in temperature can alter the quality of the light. On a cold day, the steam curls from every heat source. In the desert, the hot air rising from a highway can imbue a shot with a sense of unbearable heat as the light is distorted through the shimmering haze.

Obviously, you cannot control the weather or the temperature, but you can use naturally occurring conditions when the opportunity arises. Professional filmmakers, of course, can “make” weather to some extent with fog and rain machines. Wetting down the streets to create water reflections and glitzy highlights is a time-honored movie tradition. But even without such resources, the lighting in different weather conditions can provide the perfect atmosphere for a special scene. With a weather report and a little patience, there is nothing to stop you from using natural weather conditions to your advantage.

**Indoor Lighting**

Interior lighting demands a certain amount of flexibility—a willingness to make things work even in difficult conditions, especially on location. In a studio equipped with an overhead grid, a full complement of lighting instruments, and other accessory equipment, lighting is much easier to set up and control. A friend’s living room, a neighborhood restaurant, or a lecture hall at school may be the perfect setting for your movie, but it may be a nightmare to light in terms of mounting the lighting instruments or obtaining adequate power. Good location scouting can alleviate some of these problems, but successful indoor lighting still requires an ability to adapt to each new situation.

**Shooting in Available Light and Low Light**

In some cases it may be possible to shoot indoors, relying totally on available light, such as the light provided by an overhead fixture or sunlight coming through a window. In both film and video, shooting in available light is a more viable option than ever before. Each new generation of lenses seems to be faster, and new film stocks and electronic imaging systems require less light to record an image. Still, even with these improvements, shooting in available light may not produce a satisfactory image. It may be difficult, if not impossible, to control
adequately the intensity of available light, its color temperature, or its direction. Thus, shooting with available light almost always involves trade-offs and compromises. And available light almost always means low light levels in interior locations.

In general, low-light shooting is somewhat easier in film than in video. If the available light is inadequate for a particular film stock and lens combination, the most common solution is to switch to a faster, more light-sensitive film stock. Professional filmmakers, in fact, often use two types of film when shooting a movie: a slower, more fine-grained stock for outdoor shooting (where light levels are seldom a problem), and a faster, tungsten-balanced stock for shooting interiors or low-light situations. Film manufacturers have continued to improve film speed, producing stocks that are not only more light sensitive but also finer grained, as well.

In a situation in which the light levels are still too low for the film stock, the film can be shot as if it actually had a higher EI. This requires a special laboratory procedure called pushed processing, or forced development. Pushed processing entails increasing the developing time (or temperature of the developing chemicals) as the film is processed. It can raise the effective EI of film stock by as much as one or two f-stops. There is a trade-off, however. Pushed processing tends to increase grain and contrast in the image. Negative film can be pushed more than reversal film, but pushed processing usually results in reduced image quality. Much the same thing occurs when you boost the gain of the video signal electronically.

**Bounce Lighting**

A common problem in location lighting is hiding lights (particularly the back light) from the camera’s view. The low ceilings in most locations make it impossible to suspend the lights above the scene, which is the usual procedure in a studio with an overhead lighting grid. One way to provide back light or additional fill in a cramped interior location is to bounce light into the scene.

Bounce light is light reflected into the scene from the ceiling or wall. Aim a lighting instrument at the ceiling and adjust it to the proper angle so that the reflected light falls where you want it (see Figure 6.9). This tends to create a diffused, even kind of lighting and can be a valuable way
to establish an overall baselight level for an interior location.

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<TXP>Obviously, bounce lighting will not work if the ceiling is too high or too dark to reflect the light. It works best if the ceiling is white or a light-colored material because bounced light will pick up the color of the surface from which it is reflected. This kind of subtle color shifting is difficult to compensate for in film, but white balancing in that light should adjust the color balance correctly for a video camera.

If bouncing light is not workable in a particular location, one solution might be to amplify the light in the practical lights on the set—the table lamps or lighting fixtures that already appear in the scene. This may entail replacing the bulbs in those lamps or lighting fixtures with higher-wattage 3,200-degree Kelvin bulbs. You sometimes can achieve a similar effect by placing a very small lighting instrument, such as a Nooklite (see Figure 6.10), in a corner of the set where it can be blocked from view by a piece of furniture.

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<H2>Mixed Lighting</H2>

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---<TXP>If you shoot this scene on daylight-balanced film stock, the person’s face will be red. With tungsten-balanced film stock, the face would be correct, but the sunlit background would be very blue. With video, there will be the same discrepancies depending on whether you
white balance for indoor or outdoor light. There are several ways to solve this problem. One is to place sheets of orange color conversion filter (the same filter used to shoot tungsten-balanced film in daylight) over the window. Another is to match the color temperature of daylight by using daylight-balanced 5,500-degree K lighting instruments, such as HMIs or kinos with 5,500-degree lamps. A third method is to convert 3,200-degree lights to 5,500 degrees by placing blue filters over them. Any of these methods will make all the light roughly the same color temperature (see Figure 6.12).

Another form of mixed lighting involves fluorescent lights commonly found in commercial buildings and schools (as opposed to high-frequency fluorescents). These lights break up the spectrum, usually emitting only a few wavelengths, primarily the greens and blues and very little in the way of reds. Similar problems occur with other “non-continuous” light sources such as the mercury vapor or sodium lamps commonly used in streetlights or in large commercial applications. If only fluorescent lights are used, white balancing a video camera under them can sometimes produce satisfactory results, especially if the lights are warm-white. Film is more problematic. The broken color spectrum presented by the fluorescent lights will fool some color temperature meters. Most cinematographers use tungsten-balanced film to shoot under fluorescent lights, but depending on the bulb type, daylight film might be more appropriate. If fluorescent light is mixed with daylight, tungsten light, or even high-frequency fluorescents, the result will probably be quite unsatisfactory. The film lab or the nonlinear editing system may be able to correct the color somewhat, and filters over the camera lens may help, but you need to experiment because there are many types of fluorescent bulbs.

The easiest solution is to turn off the office-style fluorescent lights and light the scene entirely with tungsten, kino, or LED lighting instruments. In fact, in many mixed-lighting situations, the simplest solution may be to block out one of the sources. Closing a heavy curtain over the window might reduce the sunlight enough to allow the tungsten lights to dominate the lighting of the scene. Conversely, turning off all the lights and working only with light coming in
the window might work. Depending on what is being shot, it may be acceptable to let the light
coming through a window in the background go blue. Certainly this seems to be more common
than it once was in film and video.

**Lighting for Movement**

Lighting a scene in which a character (or the camera) moves is much more
difficult than lighting a single fixed area. Most directors draw up a **blocking** diagram for shots
that contain

complicated movement. The cinematographer needs to look at the blocking diagram, or at least
consult with the director, to see precisely where the movement occurs and whether any particular
areas within that movement require special emphasis. For example, a woman walking from the
door to a desk needs to be lit as she walks; however, but may need more balanced, three-point
lighting **may be required** when she picks up a notepad from the desk at the end of the movement.

Drawing up a **lighting plot** on graph paper is a good way to begin planning. A
lighting plot is a diagram of the set that also shows the camera position, the location of lights,
their size and type, and the direction they will be pointing (see Figure 6.13). Using one means the
lights can be set up and placed in position even before the actors arrive on the set. The lights
cannot be focused or finely adjusted, however, until the director actually blocks out the scene with
the actors. This is one reason **stand-ins** are used in movie production. Lighting a spot where the
actor will stand is not the same thing as lighting a 6-foot actor or his stand-in.

Perhaps the easiest method of lighting for movement is simply illuminating the entire
area with soft, diffused lighting (see Figure 6.14). This avoids some of the problems associated
with uneven lighting in a large area, **such as** actors walking in and out of hot spots or
disappearing into darkness between pools of light.

For a shot in which a character moves toward or away from a light, you can place a half-
scrim on the lighting instrument to even out the lighting. The half-scrim should mask the bottom
of the light with the open (unscrimmed) half at the top (see Figure 6.15). If the light is angled correctly, the half-scrim will reduce light intensity near the light but allow full illumination farther away, evenly balancing the light intensity between the two positions. This allows the character to walk closer to the light without the illumination becoming excessive.

Another common technique for lighting movement is to use standard three-point lighting for the areas that require it and to add fill lighting in the gaps between those areas. In this situation, an incident light meter is especially helpful for checking light levels across the entire scene area, particularly in the gaps between lighting triangles. A similar technique involves overlapping the areas of key, fill, and back lights. This way, the same light performs different functions in different parts of the set. The key light can be the primary light source when the actors are in an entryway, but when they move over into the living room, that light might provide back light.

In any lighting setup, special care must be taken to avoid unwanted shadows. Multiple shadows or the shadow of the sound boom draws the viewer’s attention to the lights. These problems intensify if the shot contains movement. The shadow of a moving sound boom (as it follows the actors) is too obvious to ignore.

You can reduce or eliminate such shadows in several ways. Shadows tend to be much more conspicuous against a light-colored background than against a dark background or dark floor.

Adjusting the lights to a different angle can eliminate shadows or at least shift them out of frame so they are not visible in the shot. Placing the actors farther from the wall will also make their shadows less visible. Sometimes a flag or barndoor can block the light that is causing a boom shadow. If that is not possible, moving the boom to a different position or miking the sound without a boom might work. Finally, altering the quality of the light in the scene may be the easiest way to reduce shadows. If the lighting is hard, the shadows are more intense. Simply diffusing the light to produce a directionless, overall illumination will diminish most shadows.
The director’s rehearsals with the actors provide a final opportunity to recheck the lighting to see whether movement in the shot introduces shadows that were overlooked as the lighting setup was being completed. The time to catch hot spots, dark areas, or moving shadows is before shooting begins.

**Lighting for Multiple Cameras**

Increasingly, directors want to shoot with several cameras simultaneously so that they can capture the same emotional level for editing or can be sure that they capture a particularly difficult shot that may be hard to repeat. This means the lighting must sometimes look good for both long shots and close-ups, as well as for a variety of angles.

Some of the same techniques used for lighting for movement also work for multiple cameras. For example, illuminating the whole set with soft, diffused light assures that shots will be evenly lit regardless of where any particular camera is located. Lights can also serve multiple purposes, such as being the key light for the A camera and the back light for the B camera.

Multiple cameras introduce the problem of shadows from one camera being in the shot of another camera. Or one camera can block a light source needed by another. Lighting plots that show where each camera will be positioned, and then moved to, help solve those problems before they occur.

Placing a light source on the actual camera itself can help create proper illumination for that camera. The fluorescent or LED lamps that fit as a ring around the camera lens (refer back to Figure 5.12) are particularly appropriate for this. Of course, the light cast by the ring must be compatible with the light needs of other cameras shooting the scene.

Lighting for multiple cameras is challenging, but certainly not impossible. Like many other aspects of lighting, nothing beats experience when it comes to the art of illuminating scenes effectively.

**Lighting for Visual Effects**

Lighting for visual effects requires special techniques. As mentioned in Chapter
when live scenes are going to be combined with computer-generated material, actors usually perform in front of a **chroma key** green or blue screen. This screen must be evenly lit *in order* for the blue or green to drop out effectively during postproduction. If it has shadows or if one side of the screen is darker than the other, the drop out will only be partial or the effect will look like it rips. Softlights are the best ones to use for chroma key because they give an even light. Light meters or **waveform monitors** are very valuable in chroma key situations. They should give readings that are the same across the whole screen.

Actors should also stand as far away from the screen as possible, so that any shadows that their bodies may cast will not fall onto the screen but rather will fall onto the floor. It is also a good idea to use a backlight that forms a rim of light around the *talent's* hair. In that way, there will be a clean cut between the hair and the green screen. It is also important to keep in mind that the lighting of whatever is in the foreground is going to have to be the same style as what is going to be used for the background, so that the two will mesh.

**Variations in Lighting**

The mood created by lighting is established to a great degree by the **lighting ratio**—the ratio of the key light plus the fill light to the fill light alone. If, for example, the key light and the fill light together have an intensity of 300 **footcandles**, and the fill light alone equals 100 footcandles, the lighting ratio is 3:1. You add fill light to the key light because the fill light actually provides some illumination to the key side of the subject. This ratio is often expressed as the f-stop difference between the key and fill. A 2:1 lighting ratio has one f-stop difference between key and fill and the fill alone; a 4:1 ratio has a two f-stop difference; an 8:1 ratio has a three f-stop difference.

A commonly recommended lighting ratio is 3:1, though film will still show some shadow detail with a lighting ratio as high as 8:1 or 10:1, and video is acceptable at 8:1. The lighting ratio between the key light and the other lights on the set, such as the back light, the kicker light, or the background light, is far more subjective. It depends in part on how much...
light the subject or background will reflect and on the particular mood you are trying to create.

Lighting is often described as high key or low key (see Figure 6.16). These terms can be extremely confusing. **High-key lighting** is generally bright, even illumination. The key-to-fill ratio is low, resulting in a low-contrast image. It might be easier to understand high-key lighting if we used the term high-fill, because the fill light intensity is actually high in relationship to the key. Conversely, **low-key lighting** uses a low amount of fill light in relationship to the key. That is, the ratio of key to fill is high in low-key lighting, as much as 8:1 or higher.

Historically, the tendency has been to use high-key lighting for lighter subjects, such as comedies and musicals. High-key lighting is bright, happy, and relatively flat. Low-key lighting is much darker, more brooding, and harsh. Dramas, horror films, and thrillers—the kinds of movies in which something, good or evil, is always emerging from the shadows—traditionally use low-key lighting.

Other factors help to determine the emotional impact of the lighting. The direction of the light (front, side, or back), the angle of the light (above, below, or eye level), and the quality of the light (hard or soft) can affect the image as profoundly as the lighting ratio. For example, lighting from the front tends to reduce shadows and flatten the image. If frontal lighting is soft and diffused, it will also smooth out the texture of the surface it illuminates. Lighting from the side creates sharper shadows, particularly with a hard light source. Side lighting throws the subject into relief and can highlight texture with small shadows. Backlighting can be used to emphasize depth.

Shooting directly into the light **silhouettes** the subject, accentuating its outline while minimizing specific details. This can make the image more abstract. Lights angled sharply from above or below create more distinct, dramatic shadows than lights closer to eye level. Light from directly above creates a pool of light on the subject it is aimed at and obscures the background—a type of light often referred to as **cameo**. Selective lighting on one part of a shot (such as a woman’s hands) is often called **Rembrandt lighting** because it was a style used by the famous
painter (see Color Plate 11). The shape, the color, and the sense of depth can change dramatically, according to whether the illumination is hard and direct or soft and diffused.

The number of variables in lighting makes the combinations almost infinite. The photos in Figure 6.17 show various lighting strategies.

Technological advancements make possible at least one generalization about lighting: The tendency today is to use fewer lights. Faster lenses and more sensitive imaging systems in both film and video make it possible to use less lighting, to place lights farther away, and to have more shadow areas within the shot. This, combined with the newer, cooler lights, makes the set or location more comfortable for the actors. It also makes changing lighting setups much faster because there are fewer lights to move and you don’t have to wait for them to cool down.

One of the best things about the video revolution is the widespread availability of DVDs and video rental stores. The opportunity to rent and watch a wide variety of films means you can study lighting as never before. Lighting defines the tone and style as much as any element in a movie. In the hands of talented directors, production designers, and cinematographers, the approaches to lighting are almost infinite.

Notes

1. See, for example, almost any issue of American Cinematographer or Lighting Dimensions. Some books that deal with lighting include John Jackman, Lighting for Digital Video and Television (Gilroy, CA: CMP Books, 2004); Tom LeTourneau, Placing Shadows: The Art of Video Lighting (Woburn, MA: Focal Press, 1998); and Dave Viera and Maria Viera, Lighting for Film and Digital Cinematography (Belmont, CA: Wadsworth, 2005).


5. See, for example, Kodak’s 35mm tungsten-based color negative film, Kodak Vision 5289, or its 16mm 7289, both of which have an ASA of 800 tungsten and 500 daylight with an orange color conversion filter.

6. Depending on atmospheric conditions and the time of day, the color temperature of blue skylight can range from 7,000 to 30,000 degrees on the Kelvin scale.


Chapter 6 Captions

<Figure 6.1> In these scenes from Rocky, Sylvester Stallone is seen (a) in a lighting setup that is basically realistic and (b) in a lighting setup with expressionistic. (Photos supplied by Globe Photos, Inc.) NEW PHOTOS. Provided on CD-R as 06.01a realistic and 06.01b expressionistic

<Figure 6.2> This scene from Merchants of Venus is an example of lighting a scene in a way that is believable but not realistic. This is actually only a shell of a car with lights from under a mostly nonexistent dashboard—a place where lights would not be in real life. To enhance the effect of a car being driven down a street at night, director Len Richmond had crew members whiz by with white and red lights to give the effect of passing headlights and taillights. (Photo from Len Richmond’s Merchants of Venus courtesy of Amazing Movies, Dianna Ippolito, photographer) PICKUP PHOTO. Old 6.2

<Figure 6.3> (a) The basic angles for the key and fill lights in relation to the camera subject and (b) the vertical angle above the camera subject for the key and back lights. PICKUP ART. Old 6.3

<Figure 6.4> A complete lighting setup with key light, fill light, back light, kicker light, background light, and eyelight in their typical positions. PICKUP ART. Old 6.4

<Figure 6.5> (a) Shooting against (into) the light can create many problems with exposure, flare, and unwanted reflections. Shooting with the light (b) usually eliminates these problems and is almost always easier. PICKUP PHOTOS. Old 6.5

<Figure 6.6> Reflectors are an excellent way to bounce light back into a scene. (Photo courtesy of Dalaklis-McKeown Entertainment) PICKUP PHOTOS. Old 6.6

<Figure 6.7> Night-for-night lighting created by cinematographer Vittorio Storaro for Francis Ford Coppola’s Tucker. Turning all the lights on in the Tucker car assembly plant provides backlighting for the actors and motivation for the unseen light source illuminating them from the upper right-hand side of the frame. (TM and © Lucasfilm Ltd. [LFL] 1988. All Rights Reserved. Courtesy of Lucasfilm, Ltd.) PICKUP PHOTOS. Old 6.7
Director Carl Dreyer exploits the diffused light of a fog-shrouded forest in Day of Wrath. PICKUP PHOTOS. Old 6.8

As long as the ceiling and walls are light (preferably white), light can be bounced back into the scene to produce relatively soft, even illumination. PICKUP ART. Old 6.9

A tiny Nooklite can be hidden easily behind objects within the set. This kind of instrument is invaluable for lighting hard-to-reach areas. (Photo courtesy of Great American Market) PICKUP PHOTO. Old 6.10

A typical mixed-lighting situation. The sunlight’s color temperature (5,500 degrees Kelvin) is different from the tungsten-balanced (3,200 degrees Kelvin) instruments providing the main light for the man’s face. PICKUP ART. Old 6.11

Three solutions for a typical mixed-lighting situation. Gel the windows with orange filter gels (a). This will match the more bluish sunlight to the much redder 3,200-degree Kelvin light indoors. By using a daylight-balanced (5,500-degree) HMI light indoors (b), the color temperature will match the sunlight streaming through the window. A 3,200-degree Kelvin light could also be converted to a temperature of 5,500 degrees Kelvin with a blue filter placed on the lamp (c). The disadvantage of this approach is that the filter greatly reduces the amount of light from the 3,200-degree instrument. PICKUP ART. Old 6.12

A lighting plot with a key explaining the type, power, and function of each instrument. In this example, the lights are hung from a grid. PICKUP ART. Old 6.13

The soft light from these high-frequency fluorescent lamps can be effective for much of the distance that the woman might move with the shopping cart. (Photo courtesy of Lowel-Light Manufacturing, Inc.) PICKUP PHOTO. Old 6.14

A half-scrim is invaluable when the subject must move closer to the lighting instrument (with a subsequent increase in illumination). By reducing the light emitted from the bottom half of the instrument with a half-scrim, the light intensity can be balanced more evenly between the two positions. PICKUP ART. Old 6.15

The same scene with low-key lighting (a) and with much brighter high-
<FN>Figure 6.17  
(a) In this scene from Len Richmond’s Merchants of Venus, the bright lights inside the shop turn Michael York into a silhouette. Before he arrived in front of this shop, he was walking down the street in a long tracking shot where his face was lit by light mounted on a camera.

(b) In Carl Dreyer’s Day of Wrath, the lighting consistently casts shadows across the face of the young woman, Anne, who is accused of witchcraft. The brooding, low-key lighting in this film underscores its deep sense of mystery and ambiguity. 

(c) The kino light mounted on the ceiling casts soft light onto the table. 

(d) This flattering photo of Beverly D’Angelo was created from natural light and reflectors—but no artificial lights. Beverly wore special makeup with little particles in it that reflect light and give her face a glowing look. 

(e) This is a typical low-key shot from Ingmar Bergman’s The Seventh Seal. The ratio of key light to fill light is fairly high.

(Photos (a) and (d) from Len Richmond’s Merchants of Venus courtesy of Amazing Movies, Dianna Ippolito, photographer of (d). Photos (b) and (e) from Janus Films. 

Photo (c) courtesy of Kino Flo, Inc.)