LIGHTING
FOR PHOTOGRAPHERS

AN INTRODUCTORY GUIDE TO PROFESSIONAL PHOTOGRAPHY

SECOND EDITION

JOE LAVINE AND BRAD BARTHOLOMEW

A **Focal Press** Book

Lighting for Photographers

Lighting is one of the most important aspects of any photograph. The best images create dimension and drama, which goes beyond formulas and lighting recipes. In *Lighting for Photographers: An Introductory Guide to Professional Photography*, commercial photographers and instructors Joe Lavine and Brad Bartholomew offer a unique philosophy of lighting, starting with an understanding of the characteristics of lighting to build great shots.

Including interviews from professional photographers and illustrated with over 200 images, this book introduces basic photographic concepts and equipment needs, and takes the reader from the lighting process through to starting a successful career in photography both in the studio and on location. Readers will learn a comprehensive approach to lighting including what light does, composition, experimentation, practical tools and techniques, equipment, metering and histograms, and how to launch and grow their career.

With downloadable instructor resources featuring discussion questions and quizzes, this fully updated edition is ideal for introductory level photography and lighting courses as well as the amateur photographer looking to apply the appropriate lighting to realize their conceptual and aesthetic goals.

Joe Lavine has been practicing photography for over 30 years. He specializes as a food and beverage photographer, with clients ranging from small restaurants to Fortune 500 companies including Coors, Betty Crocker, General Mills, and Coca-Cola. He teaches photography at university level and regularly lectures at colleges and seminars around the US.

Brad Bartholomew is an award-winning commercial photographer, head of the Commercial Photography Program at Arapahoe Community College and has taught classes at the Colorado Institute of Art for over 30 years. He has shot a variety of subjects for local and national clients including Apple, Celestial Seasonings, the Colorado Ballet, Pentax, and JD Edwards.

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"How we shape and control light is how we speak as photographers. In this book the authors share their experiences as professional photographers by teaching the process of building with light. They encourage the reader to learn basic lighting techniques and then break new ground to create something extraordinary. This is a great book that covers more than just the basics of lighting, geared toward individuals who want to take their photography to a new level and begin a professional career."

JEROME STURM
Photographer/Digital Artist

"Whether you are a beginner or pro, *Lighting for Photographers* is an essential guide to get you started or improve on the lighting skills you have. From detailed explanations of equipment to information techniques and concepts, this book is the most up-to-date and thorough guide to photographic lighting that I've seen."

JUDITH PISHNERY
Photographer, Professor and non-profit
Arts Organization Executive Director
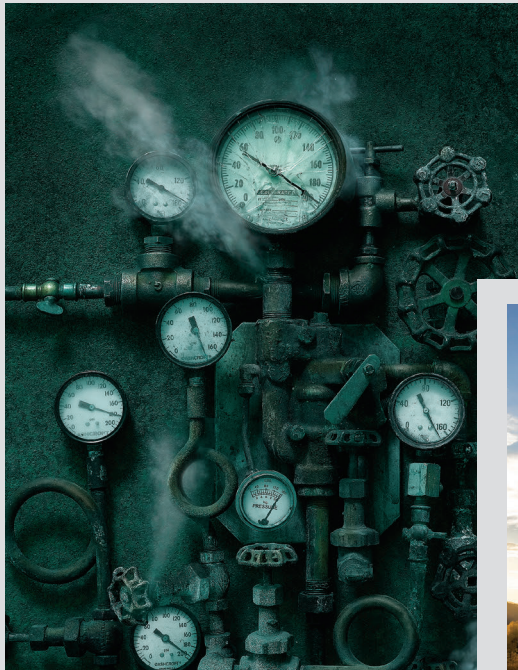
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Introduction

It has been several years since we wrote the first edition to this book. For several reasons we began contemplating writing a second edition, but the process seemed daunting, and we initially hesitated jumping in. We wondered was it really necessary, how would we make it fresh, and what would we change? After all, how much has really changed in terms of light, what you do with it, and how the photo industry has reacted to the changes? The truth is, a lot has changed. When we stepped back and looked at our own careers we saw significant changes. What we shoot and where we shoot are very different from when we wrote the initial book. We no longer own studios, but instead rent spaces when we need them. We photograph more on location, and we photograph a wider array of subjects including an increase in a variety of portraits.

Discussions with many photographers confirmed that we are not alone. Photographers are reducing overhead, and increasing revenue by changing what and where they shoot. As an example, we know quite a few port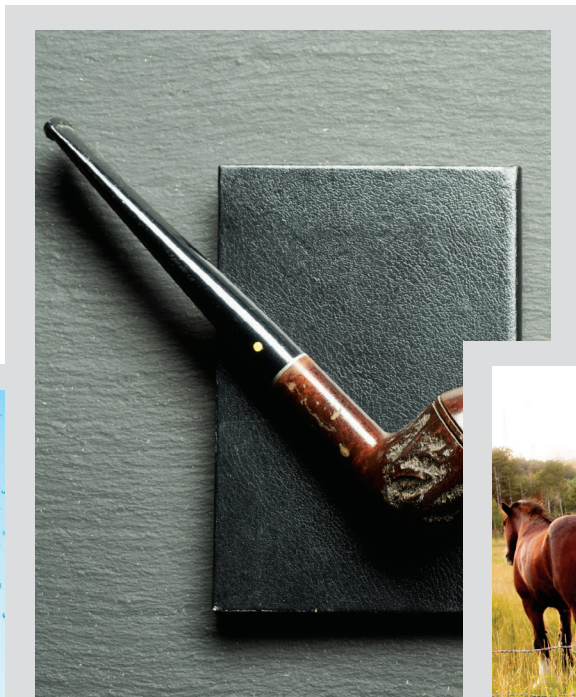rait photographers who have given up their studios to shoot on location, and they rent space when the client wants a more formal studio portrait. A looser more documentary style of portrait photography is more in vogue. Clients want images that feel authentic and not overly staged. The lighting that accompanies this style is very different from the style achieved in a more controlled studio environment and there are a number of new lighting tools available that help facilitate these changes.

This edition will explore some of these changes. You will find more images of people and more photos shot on location. However, the core of the book remains the same. Our basic philosophy of lighting has not changed. Lighting is a building process. It starts with studying your subject, deciding what you want ot say about that subject, and then constructing a lighting scheme that tells that story.

In theory, building a home is a relatively easy process. You have blueprints that tell you how the building will come together. There is a list of materials and a sequence that needs to be followed so that they are assembled properly. If you follow the plans, the home will come together. Yet sometimes things leak, creak, or have unsightly gaps. The theory is relatively simple, but in practice it's not always easy to get the results you desire.

Lighting a photograph is very much the same kind of endeavor. The theory is simple, but creating beautifully lit images is not an easy thing to do. In theory, light needs to do only a few things. It should create volume in the subject matter; it should separate objects from one another and the background. The light should create texture and perhaps drama. Simply get the light to do those few things and presto, you have a great image. Just follow the blueprint.

Many good books have been written about the subject of lighting. Many of them provide the readers with plans to follow to achieve specific results. They include diagrams with lighting placement and lighting ratios: If you place your subject here and put this kind of light on it in the following amounts, you'll get the following results. There is nothing inherently wrong with this formula except that it's by nature, formulaic. Lighting a photograph should be anything but formulaic. Lighting is one of the most important creative components of any image. In fact, we'd go so far as to say that it's the most important component. It's what we do as photographers. Lighting is how we create our images. It must be a creative, not a formulaic process.

Returning to the building analogy—what if we want to move the bedroom to the other side of the house? What if I want a two-car instead of a one-car garage? Well, I have a plan for the original layout not the new one. Sure, I can probably find a blueprint

for the house, but then my house will be just like the cookie cutter homes in the neighbohood.

You do not want your photographs to look like everyone else's photos. That's why this book will rely on few recipes, few diagrams, and few set-in-stone guidelines. To benefit from reading this text, you'll need to do more than simply follow a set of rigid preset rules. You'll need to be willing to experiment; you'll have to be willing to fail as you learn to create images that reflect your own personal taste and style.

You can start this process by really paying attention to the light you find all around you. What are the qualities of early morning sunlight, light on a cloudy day, or dappled sunlight coming through the leaves of an overhanging tree limb? What do the highlights, shadows, and cast shadows look like? Does the light enhance or diminish texture? Most important, how does the light make you feel, does it reach you on an emotional level? Intense observation will help you to develop your own lighting language.

Of course, we have to start with some basic principles, principles that you'll be able to apply to your own subjects. We'll give you many examples to help guide you through the process, but it's imperative that you don't think that the exact lighting used in these examples will work for your specific subjects. It won't be as easy as setting up our lighting schemes to duplicate our results. We are showing how to build a Mid-Century Modern, but you may be trying to build a Dutch Colonial, or Victorian house. The principles are hugely important, and they will help, but you'll need to do your own experimentation and incoporate your own observations to get the results you desire.

OK, then—this book isn't a collection of lighting blueprints. It's not a strictly technical how-to book. So what is it? It will be your guide to fully immerse yourself in the ways you can get light to do what you want it to do. Ultimately, you want light to accentuate the positive aspects of what is in front of your camera while it hides or diminishes lesser attributes. You want your light to enhance your concepts and make the viewer appreciate the image aethetically and feel it on an emotional level. The secret is that no simple

solutions to solving these problems exist. The key idea here is that you are making conscious decisions. You're not taking photographs; you are making them. You are constantly analyzing your subjects, and you make a series of choices and decisions to help portray these subjects in the way you wish them to be portrayed.

The entire process starts by thinking; thinking about each individual subject you shoot. You must know exactly what you want to say about what you are about to photograph. Are you trying to minimize or maximize texture? What's good for one subject might be terrible for another. An old sea captain might look great with a hard cross light that brings out the weathered crags in his face, whereas your grandmother might not appreciate the same lighting treatment.

These are your choices as you start the process of lighting your shots. Examine your subject and customize the light to tell your story. Using the same lighting schemes for all your images is a sure way to run your career right into the ground.

We'll show you how to use specific tools to create unique and cogent lighting. You'll explore the analytical skills necessary to bring your subject to life through lighting that works for that specific subject and for the way you see it, him, or her.

In addition to discussions about lighting in the abstract, we'll examine practical tools and techniques to make your image making easier and more effective. We'll begin with simple, inexpensive equipment options. (Yes, there are ways to create fabulous light that don't cost a lot.) As the book progresses, we'll consider more complicated and more expensive alternatives. As your careers progress and your job assignments become more complicated, clients' and other viewers' expectations of you and your abilities will also grow. This can be both exciting and intimidating.

It's important to understand that you won't have all the equipment you need at the very beginning of your career. Almost all photographers start their careers with relatively simple equipment, and then they add to it as needed. We'll help you get the most out of each piece of lighting equipment that you acquire.

One of the major focuses of this book, in addition to lighting effectively, is the goal of growing your business

and all that will entail. While hobbyist photographers might enjoy this book, it's really geared toward those individuals who want to take their photography to a level where it can support them over a long and satisfying career. Photography is a wonderful and vexing mixture of art and science, aesthetics and technology, and creative enterprise and business. Being deficient in any of these areas will keep you from being truly successful. It's our hope that this book will help you to create dramatic and appropriately lit images that will entice others to work with you or hire you, enabling you to grow your business over time.

At its core, photography is a customer service business. Fully understanding exactly what your clients want and expect and then being able to deliver on these expectations is an essential part of running a successful commercial photography business.

The most important thing to remember as you begin reading this book is to keep an open mind. Maintain a willingness to experiment and push yourself outside of your comfort zone, beyond tried-and-true methods, so that you can develop your own unique voice. In the following pages you'll see many different examples of similar subjects lit in various ways. We've done this deliberately to help drive home the point that there is no single solution to any specific lighting problem.

After more than 50 years of combined teaching experience, we realize that often students just want to be told the right answer. We also have learned that to do so is not good teaching. The students who are truly successful use fundamental lighting principles as a foundation and then experiment as they build their own unique and compelling images. They light each subject in its own way. In short, they light right.

What Light Does

The first step is to disconnect the notion that exposure and lighting are the same thing; they are not. Exposure involves the measurement of the light. Take, for example, a beautiful scenic in Yosemite Valley; the photographer is not creating the lighting, but merely exposing it. The Philosophy of Lighting addresses the light falling on the subject. We have all seen gorgeous images of Half Dome that move us and we have seen photographs of the same Half Dome where there is no emotional effect. Why the difference? In Yosemite Valley, the knowledgeable photographer will wait for the right day, hour, minute, and sometimes even second to capture that perfect moment when Half Dome comes to life. It takes the perfect moment, the right click of the shutter to where the subject comes to life. The subject and the light become one to create a unique and moving image. The studio photographer has a little different challenge; although they will not need to wait for the perfect moment, they instead create the light that brings the subject and the moment to life.
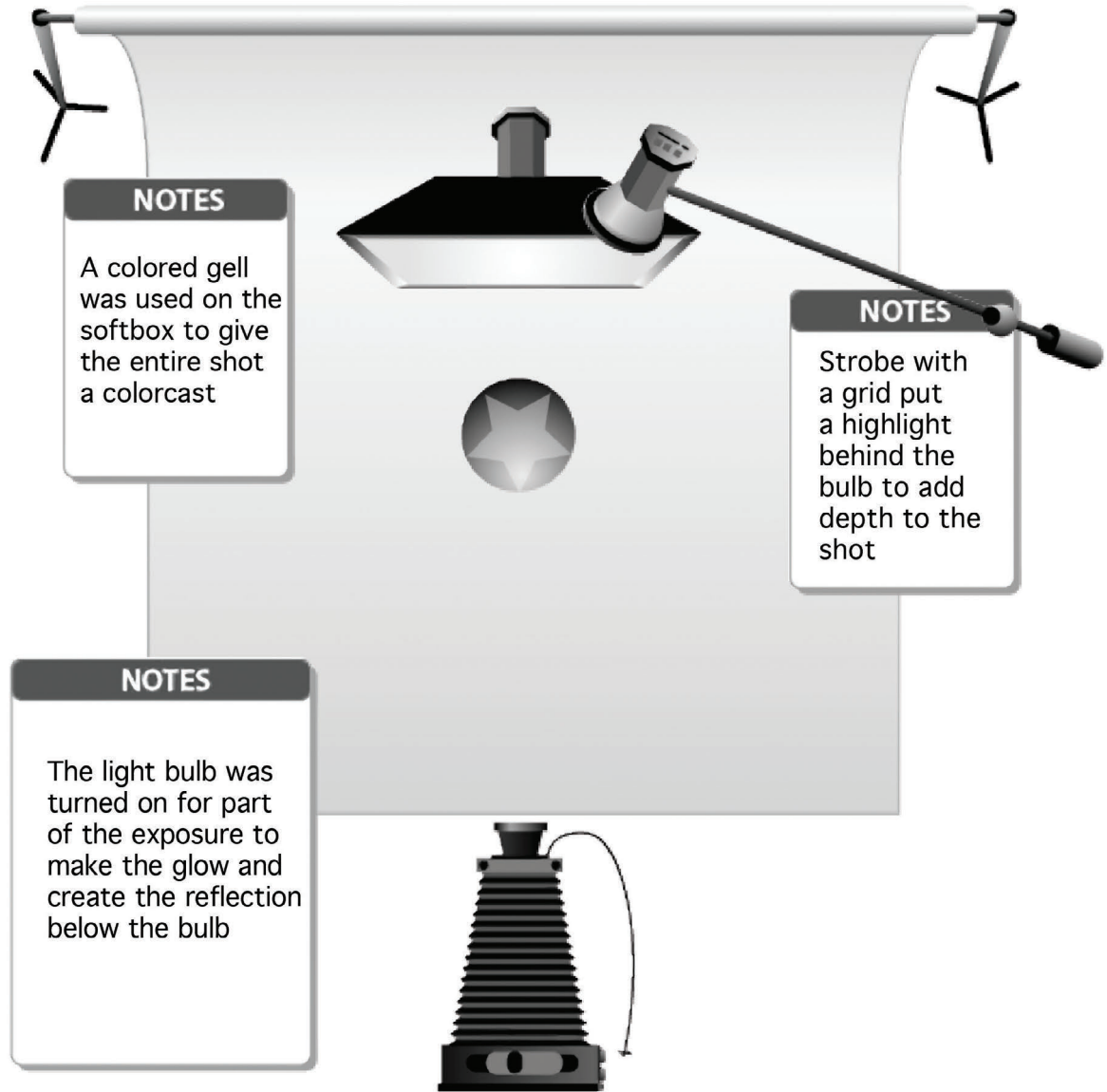
The picture of the light bulb was relatively easy to produce. It was created for a local real estate developer. The trickiest part was getting the bulb to glow. I took an extension cord and cut off the female end, and then stripped the insulation off the ends of the two wires. I took an exposure using the two strobe heads to light up the overall scene. I then put one wire against the

bottom and one wire on the back of the metal part of the bulb. This made the bulb light up, and I took an exposure with the bulb lit and the strobes working. I then composited the two images together in Photoshop and masked out the wires. Just a word of caution—be very careful when working with hot electrical wires.

Lighting is a Building Process

Light brings a subject to life. Many adjectives have been used to describe a subject where there is no quality of light; flat, dull, and dead are just a few. It is the photographer's job to incorporate and manipulate light to give an image life. This is true when shooting on location or in the studio. Why is lighting so important? Because subjects are generally three-dimensional, our mind interprets objects as three-dimensional, but photography is a two-dimensional medium; meaning the end result is two-dimensional. It is through lighting that an image gains life and the illusion of shape and form emerge.

This philosophy of lighting will weave its way through the entire book. Regardless of camera formats or digital versus film, lighting doesn't really change; it's a photographer's number one tool. The lighting techniques in the book are from two photographers

NOTES

A colored gell was used on the softbox to give the entire shot a colorcast

NOTES

Strobe with a grid put a highlight behind the bulb to add depth to the shot

NOTES

The light bulb was turned on for part of the exposure to make the glow and create the reflection below the bulb

OPENING IMAGE: PHOTOGRAPHIC EQUIPMENT

CAMERA: Sinar 4 × 5 view-camera with Leaf Aptus II Digital Back

LENS: Nikor 100mm

LIGHTING: Profoto Acute II generator and two strobe heads

LIGHT MODIFIERS: Soft box, grid, and green gel

Figure 1.2   Photographic equipment.

who have two different styles, and who specialize in two very different genres of photography, but their one common philosophy is how they approach lighting. Lighting is a building process. A common error often witnessed when watching a group of photography students or inexperienced photographers is the desire to place a subject on a table and use available light, not the pre-existing light in the environment, but rather every available light the photographer has at their disposal. It is far easier to see the effects of a single light than the sum of many. For this reason, the authors always begin with a single light, work with it until they achieve the desired result, and then, and only then, move on to adding another light, if necessary. This could mean that the single light is all that is needed or that the process is repeated until each light is added one at a time, each time building on the previous light. Over time, a photographer will inherently understand that certain combinations will not work, but a successful photographer will always experiment with new possibilities, it's how we grow as artists.

Lighting is a relatively simple process. When we look at the subject we're trying to light, it's important to think about exactly what we're trying to say about that subject. Should it be beautiful, scary, calm or dramatic? The way we choose to light that subject will go a long way toward determining if we're successful in making the proper statement.

Lighting needs to do only a few things; it needs to create dimension, separation, texture, and drama in our subjects. It's important to remember that lighting doesn't need to do all of these things in every shot. It's up to us to pick the right lighting to enhance specific attributes in each individual subject. The key words in that last sentence are specific and individual, and it's essential that you are constantly aware of the specific things you want your lighting to do for each and every subject.

This chapter will go into greater detail on the ways in which you can create dimension, separation, texture, and drama through your use of various lighting techniques. If you can learn to get your lighting to do these four things, you will be able to light anything. And if you master these four things and apply them in thoughtful ways in all your shots, you'll be well on your way to establishing yourself as a successful commercial photographer.

Dimension

The most basic effect of lighting is the creation of dimension. The world we live in has three dimensions, but photographs are two-dimensional, so we must learn how to compress three dimensions into two-dimensional space while still maintaining the illusion of three dimensions. One of the ways to do this is to light objects so that they do not look flat; instead, light them so that they look three-dimensional.

In order to explore this further, we need to grasp a couple of basic concepts and some vocabulary. The first thing to understand is the camera axis and where we place lights in relationship to this axis. The camera axis is a straight line drawn through the camera that runs an infinite distance both in front of and behind the camera (Figure 1.3).
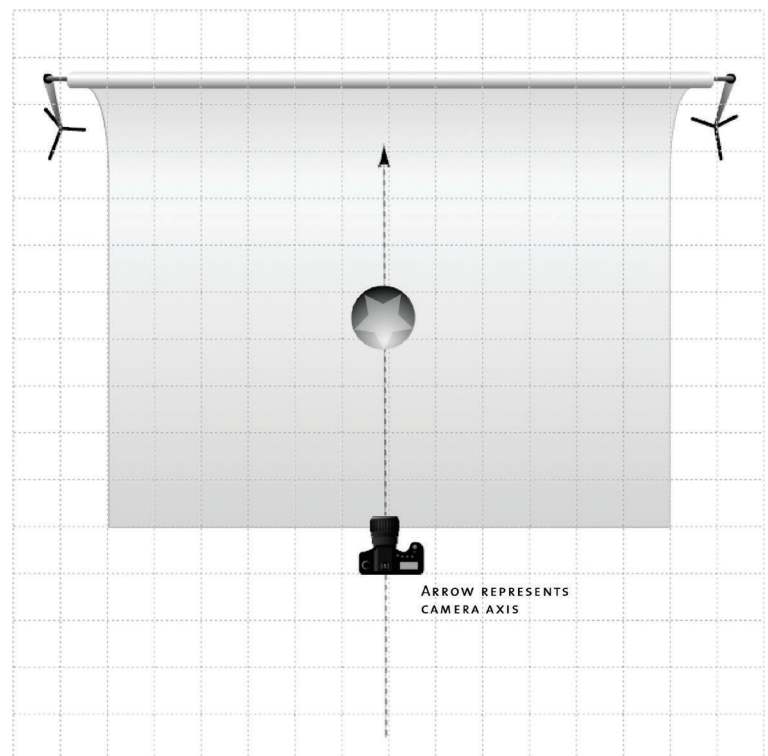

ARROW REPRESENTS CAMERA AXIS
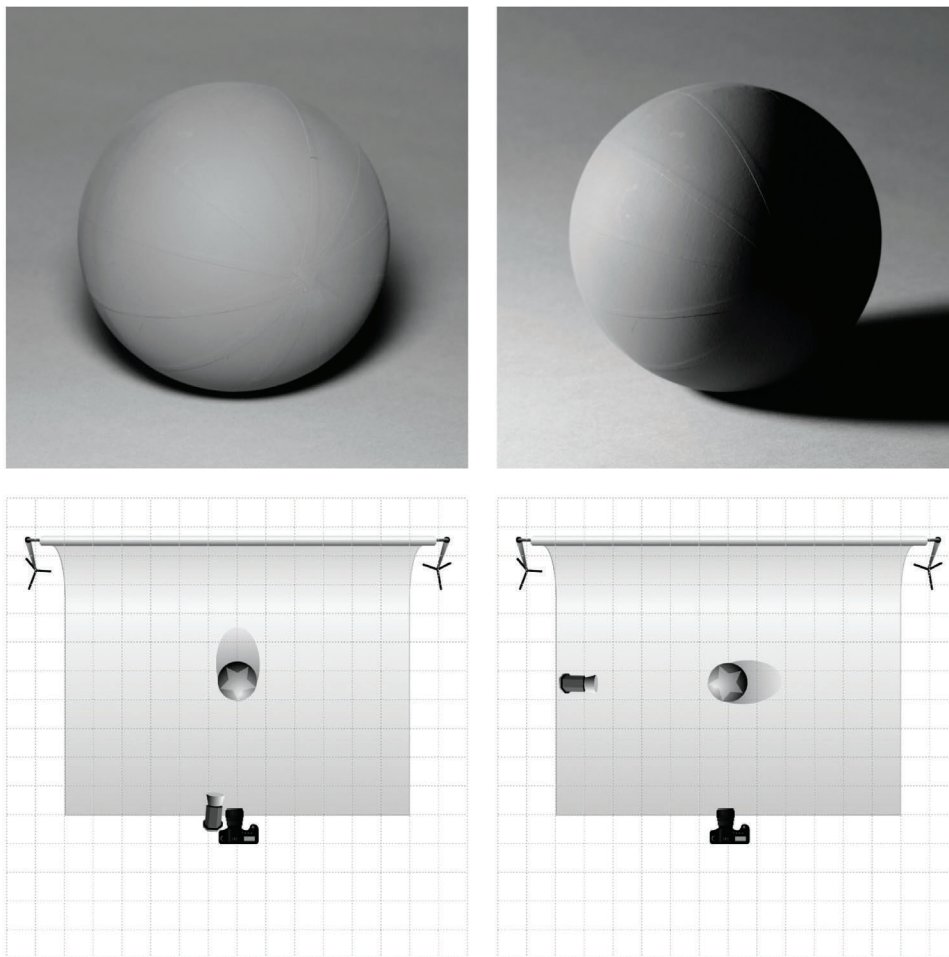
Figure 1.3 Camera axis.

Figure 1.4   Light positioned along the camera axis.

Subjects will be on this line somewhere in front of the camera. We can then draw a perpendicular line to the camera axis through our subject. Bringing the lights closer to the camera axis will reduce the amount of subject dimension created by the lights. Moving the lights either above or below the camera axis or closer to the perpendicular line running through the subject will render more dimension in the subject (Figure 1.4).

The two examples above clearly illustrate this idea. The shot with the light along the camera axis is not devoid of dimension; it is slightly brighter in the center and then gradates darker towards the edges, but it has nowhere near the amount of dimension seen in the second image, the one where the light has been moved off the camera axis.

Note

At times you might want to light images with flat light, times when lighting your subjects so that they appear two-dimensional will enhance your overall concept and what you are trying to say about your subjects. Once you understand the general rules of lighting, you can break them consciously as you experiment with your own solutions.

When Two Dimensions Can Be Effective

Composing an image with minimal foreground to background separation tends to make it feel more static. It appears more two-dimensional, and because of this it may feel more calm and tranquil. Images that have strong separation appear more three-dimensional and in general are more dynamic in nature. These are not value judgements. One is not necessarily better or worse. What is important is that you light with intent.

JOE:　　When would a two-dimensional look be suitable?

BRAD:　　Lighting a subject or scene so that it appears two-dimensional tends to simplify the image. If you want to create an image that is more static, a flatter and less dimensional lighting scheme helps you achieve this. Reducing dimension also adds a graphic quality (Figure 1.5).

Figure 1.5　Still-life lit to reduce dimensionality.

Point Source vs. Diffused Lighting

The next thing that needs to be understood is the difference between point source and diffused light. The previous photos were all taken using a single point source light. The simplest way to describe the difference between the two is to think of the sun and then compare its light to that of a cloudy day. The sun is a point source light. Clouds spread the sun's light over a large area, creating diffused light. The quality of the light from these two sources is very different.

It's important to understand that the distance between the light and the subject is a factor in determining whether a light is a point source light or diffused light. The sun is a very large light source, but because of its distance from the earth it becomes relatively small and is therefore a point source light. Moving a diffused light source away from the subject makes it smaller in relation to the subject, and if it is moved far enough away from the subject, even a large diffused light can become a point source light. For instance, taking a large softbox and moving it across the studio from your subject makes it relatively smaller, and therefore the quality of the light will change from diffused to point source.

When you light something with a point source light several things happen: you create a highlight side, a shadow side, a core shadow (darkest part of the shadow between the highlight and shadow sides), a spectral highlight (bright highlight), and a cast shadow. These elements help to describe the subject and can be used as compositional elements to help guide the viewer's eye through the shot. With diffused light you still have these elements but they are often less obvious. For instance, the spectral highlight is
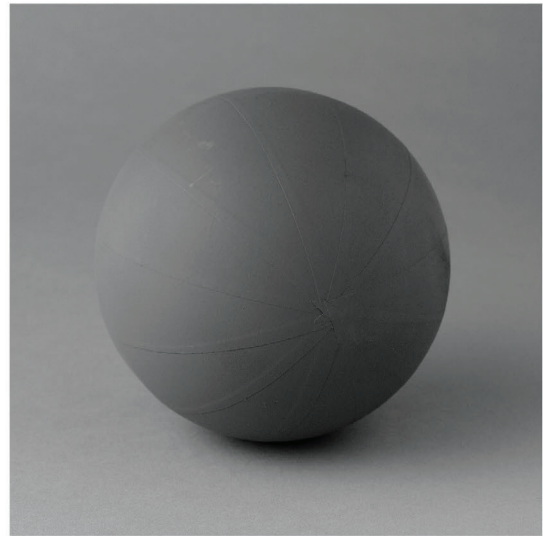

Figure 1.6   Point source lighting.

Figure 1.7   Diffused lighting.

reduced or eliminated as is the core shadow, and the cast shadow becomes softer and less obvious.

The following photographs were taken using both point source and diffused lighting, with the lights in the same position relative to the subject. Notice the differences between these two types of light sources (Figures 1.6 and 1.7).

Point source lighting can create intense specular highlights and strong, contrasty shadows. Specular highlights are small pinpoints of light that reflect off of reflective surfaces; think of the sun reflecting off of a bright chrome car bumper. There are no specular highlights on the ball shown above because it was painted with flat paint.

Diffused lighting spreads specular highlights out, creating softer, broader highlights. Diffused lighting also creates softer-edged shadows—both cast shadows as well as the shadows on the objects themselves. Specular lighting will have a faster transition between highlights and shadows, whereas diffused light will have more gradual transitions between the two. This is clearly visible in Figures 1.6 and 1.7.

Figure 1.6 shows point source lighting on a different types of subjects. The flower is being lit by the sun in a backyard garden. Figure 1.7 is the same light but a diffuser was placed between the sun and the flower. The point source light accentuates the texture of the petals and the center of the flower and it creates additional texture due to the shadows of the petals cast upon each other. The diffuser all but elimantes the shadows and softens any specular highlights. I prefer the diffused shot as I find the petals' shadows to be distracting to the overall composition.

In the studio we can create both point source and diffused light. The third section of this book will go into greater detail regarding various kinds of equipment you can use within the studio environment. But for now, we'll introduce you to some basic lighting equipment so that you can better understand the differences between point source and diffused light.

You can go to almost any hardware store and purchase a clip-on aluminum light that can serve as a point source light. You can also build a very simple device to diffuse the light. You can create the diffusion device, also known as a scrim, by buying PVC pipe cut to the desired lengths and PVC elbows, and then attaching these to one another to form a square or rectangle the size you want. You can then cover this frame with a semi-translucent material like a shower curtain or vellum paper. (We show examples of all of this in Chapter 3.) Make sure to keep the light far enough from the scrim so you don't risk lighting the material on fire. (I'm sure you're saying, "Duh, how stupid do you think we are?" Let's just say, "Better safe than sorry." After many years of teaching, although we have not seen actual flames, we have smelled a lot of smoke and molten plastic.)

The more of the scrim you cover with light, the larger the light source will become and the closer you bring the scrim to your subject, the more diffused the light will become. The closer you bring the light to the scrim material, the smaller the light will be and the further the scrim is from your subject, or both, the less diffused the light will be.

In order for a cube to look like a cube, you must light it so that you can discern three distinct planes, with each plane having a different tonal value. So how much different do the tonal values need to be? Sorry, there is no definitive answer to that. Sometimes you may want the values to be very similar and at other times you may want to have significant differences. It all depends on your specific intent.

Tip

The ball, cube, and cylinder used in Figure 1.20 were all purchased at a local hobby store. They were then painted with a flat gray spray paint. The total cost was about $15. The objects measure 4 to 5 inches across. Make sure the objects are not much smaller than this, as that would make lighting them more difficult. But if they are too large, you will need a larger surface on which to place them. It is important to use sturdy, opaque objects and flat paint so that the objects are not too reflective. Wood or cardboard objects work well; foam objects aren't suitable, as the paint often reacts poorly with the foam.

Figure 1.8   Examples of a cube with diffused light, no fill; a cube with diffused light and fill; and a cube with point source, no fill.

Lighting Ratios

The differences in tonal values are often referred to as lighting ratios. If one plane is twice as bright as another plane, there is a 2:1 lighting ratio. Another way of looking at this is that one plane is receiving one stop more light than the other side; metering the two sides would show this difference. In Figure 1.8, the left side is one stop brighter than the top, which is one stop brighter than the right side. This means that the left side and top have a 2:1 ratio, the top and right side have a 2:1 ratio, and the two sides have a 3:1 ratio. Lighting this way gives each plane a distinct tone, and these three different values are what give the object its shape and dimension.

Moving the light higher would brighten the top plane. Adding a fill card to bounce light into the dark side would lighten that plane, thereby reducing the contrast between the planes. Removing the diffusion material and using a point source light increases the contrast and produces a 4:1 ratio between the two sides.

Back when everyone shot film and couldn't view images before taking the actual exposures, it was necessary to meter the shadows and highlights to achieve the desired results. Today, metering your highlights and shadows so that you understand the basic principles of shadows and highlights and how much range there can be before you start to lose detail in shadows and highlights is a good practice. However, with the advent of digital, it's far more important to analyze each image individually, not based on formulaic lighting ratios. Instead, you decide if your lighting achieves your intentions. You can now look at the back of your camera or a computer monitor and see what your lighting looks like.

Reading Your LCD vs. Reality

A word of caution about judging your images by the LCD on the back of your camera—images often look very different once they are enlarged on a computer screen or printed. Sometimes the ambient lighting conditions under which you view the LCD can affect the way images appear. Bright sunlight can make viewing them difficult and can affect both perceived exposure and contrast. I can't tell you the number of times that I thought I had a winner by looking at the back of my DSLR, only to be disappointed when I viewed the image on a calibrated monitor. Images tend to look more contrasty on an LCD than they actually are. It's a learning process, and you will start to compensate for these differences as you light various subjects. A secret here is to learn to use your histogram, which we will address in a future chapter.

Figure 1.9   Photos of a cylinder with light from camera axis; a cylinder with light from 90 degrees of camera axis; and a cylinder with light from 90 degrees of camera axis with fill card.

The final shape we will examine is the cylinder. It can be a combination of both a sphere and a cube. Like the sphere, a cylinder has a curved surface, and if you can see its top, it has a flat plane similar to a cube. In Figure 1.9, you will see a cylinder shot with the light on the camera axis, a light moved perpendicular to the camera axis, and that same light, but with a fill card, coming from the right side. In all three cases a point source light was used.

It may seem tedious, but spending a significant amount of time practicing lighting these three shapes will go a long way toward ensuring that you fully understand the way light plays off of the various surfaces and planes. Think of it as analogous to learning the scales when you first learn to play a musical instrument. Everyone wants to pick up a guitar and start playing like Eric Clapton or John Mayer, but you have to practice the basics first in order to refine your skills. If you can learn to light spheres, cubes, and cylinders as desired, you can light almost anything. Almost all subjects you photograph will be balls, cubes, cylinders, or some combination of these shapes.

The photograph of a red apple (Figure 1.10), taken by professional photographer Howard Sokol, is an example of how refining a simple technique can lead to beautiful and dramatic results. This image was taken using a single diffused light source. In this case strobe

lights and a softbox were used, but you could achieve similar results using your tungsten clip-on light and a homemade diffuser.

Figure 1.10   Apple photographed by Howard Sokol using single light to show dimension.