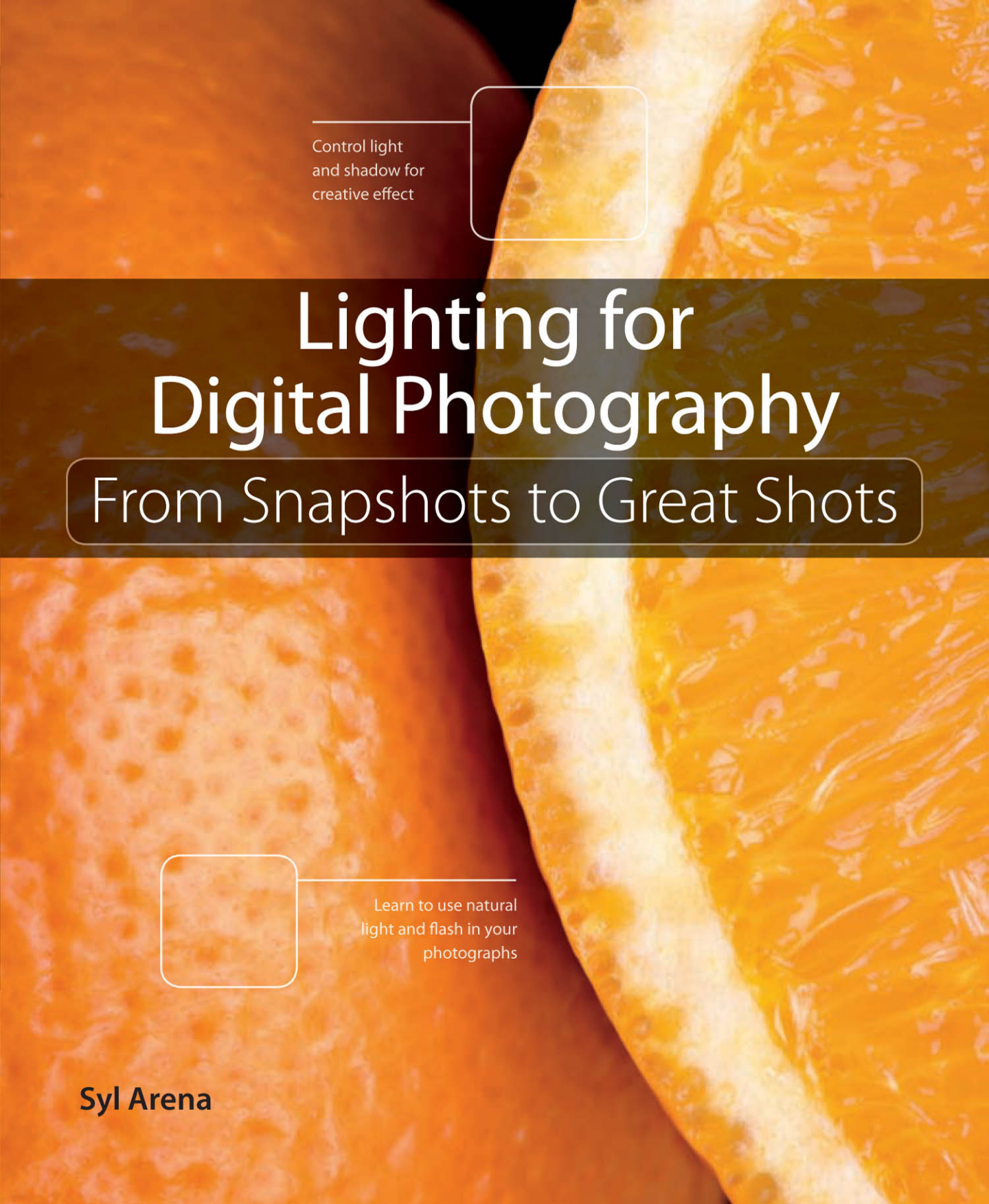
Control light
and shadow for
creative effect
Lighting for
Digital Photography
From Snapshots to Great Shots
Learn to use natural
light and flash in your
photographs
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Lighting for Digital Photography: From Snapshots to Great Shots

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DEDICATION

For Amy, the proverbial girl-across-the-street.

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ACKNOWLEDGMENTS

No book is written or photographed in a vacuum—especially this one. Thanks are owed to many.

First, to Amy and our three lads, Tom, Vin, and Tony—heartfelt thanks for accommodating my uncountable requests for you to serve as impromptu models, grips, fixers, etc. You may not have felt like you had a choice every time I asked, but you did.

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Teaching is a privilege and an invaluable opportunity to learn from those I teach. So, thanks are owed to the workshop programs that invited me to teach during the past year—Maine Media, Santa Fe, and Gulf Photo Plus in Dubai—as well as to the amazing team at B&H Photo, who let me teach in their NYC Event Space every time I asked.

Thanks are also owed to every student I've met in a workshop, seminar, or random meet-up, as well as to those who got in touch after watching me on Kelby Training or listening to me on *This Week in Photo*. Your questions and comments formed the foundation on which this book was written.

Finally, every word in this book was first read, considered, and sometimes polished by my editor—Ted Waitt. Despite my affection for the sounds that deadlines make as they go whizzing by, Ted patiently coaxed me along as the vision for this book came into sharp focus. So thanks, Ted, for shepherding me through the creation of *Lighting for Digital Photography.*

Syl Arena

Paso Robles, California
October, 2012

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Contents

1

Canon S95
ISO 320
1/125 sec.
f/5
15mm
Sunlight

The Five Characteristics of Light

PHOTOGRAPHY BEGINS WITH LOOKING AT LIGHT

Allow yourself to become obsessed with light. This is the best advice that I can give any photographer. Many shooters are more concerned with learning buttons, dials, and software than with learning to truly see light. Yet, if you become a connoisseur of light, you'll see opportunities for great shots that you did not see before. You'll also recognize when there's no pizzazz to the light and, most likely, you will not make so many disappointing images.

Photography is "writing with light." So, let's build our conversation about lighting on five fundamental characteristics of light: Direction, Intensity, Color, Contrast, and Hardness.

PORING OVER THE PICTURE

The vignette in the corners is created in camera by using a wide-angle lens.

Shooting in bright sun can be a challenge for your camera because of the extreme range between highlight and shadow. In this shot, using a bit of fill flash would have helped reveal details in the shadows. Still, I love this snapshot of my son Tony at Crater Lake, Oregon. Remember, it is better to get a less-than-perfect shot than to miss it because you were grabbing another piece of gear.

The blurred background (shallow depth of field) is created by using a wide aperture and focusing on a subject close to the lens.

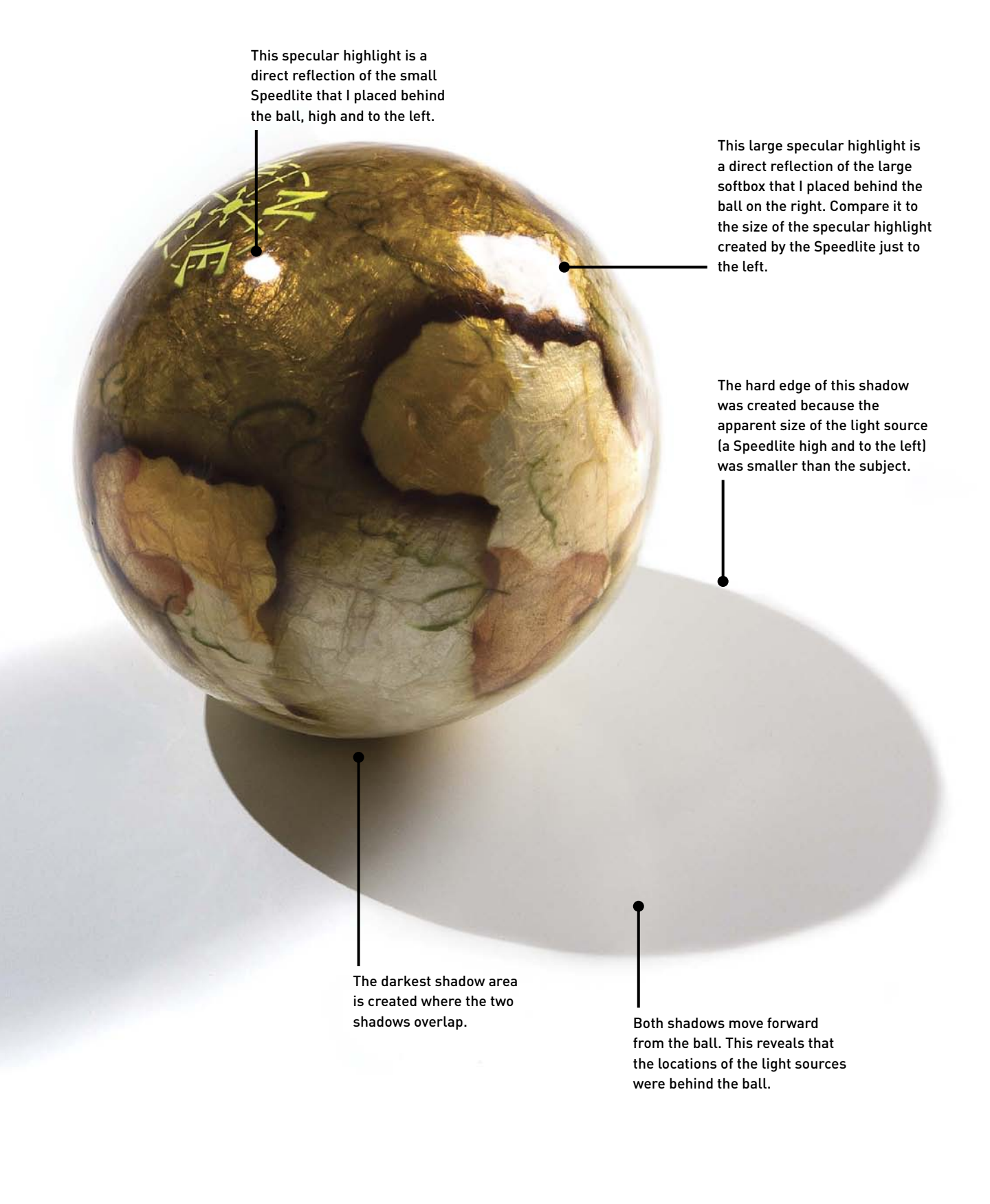
Canon 5D
ISO 100
1/4000 sec.
f/2.8
24mm
Sunlight

PORING OVER THE PICTURE

My mantra about lighting is this: "To create interesting light, you have to create interesting shadows. So look at the light and think about the shadows." In this shot of a lacquered ball, the shadows tell you everything about the lighting: the number of lights, their locations, and their size relative to the subject.

The soft edges of this shadow reveal that this light source was much larger than the ball. I used a Westcott Apollo softbox (with a Speedlite inside) to allow the light to wrap around the ball.

Canon 60D
ISO 200
1/200 sec.
f/16
47mm
Two Speedlites
and Apollo softbox


This specular highlight is a direct reflection of the small Speedlite that I placed behind the ball, high and to the left.
This large specular highlight is a direct reflection of the large softbox that I placed behind the ball on the right. Compare it to the size of the specular highlight created by the Speedlite just to the left.
The hard edge of this shadow was created because the apparent size of the light source (a Speedlite high and to the left) was smaller than the subject.
The darkest shadow area is created where the two shadows overlap.
Both shadows move forward from the ball. This reveals that the locations of the light sources were behind the ball.

START YOUR OBSESSION WITH LIGHT

The best photographers in any genre are the ones who are obsessed with light. I hope that you will join their ranks—both in terms of skill and in terms of how you look at light. To start you down the path, I encourage you to study the light around you throughout each day.

Here is a sample of observations about light I've made in a single day:

- In the morning, as I'm waking up, I study the color of a patch of golden sunlight on the wall of my bedroom.
- At breakfast, I examine the shape of the shadows around my coffee cup and solve the riddle, "Why are there three shadows?"
- At noon, I notice how sharp and small the shadows of pedestrians on the sidewalk have become since the sun is now straight overhead.
- On my way home, I enjoy the glare of sunlight as it skips off the asphalt and onto the metal siding of a warehouse.
- A half-hour after sunset, I call my wife, Amy, and our boys outside to see how the western clouds have turned salmon-orange and how the sky transitions from indigo high above down to turquoise at the horizon.

Yes, it's obvious that I'm obsessed with light. I hope that you'll start your own obsession today!

SAY "CLICK!" AND MAKE MENTAL PHOTOS

I make mental photographs all the time. I'm walking down the sidewalk and see a beautiful patch of sunlight in a park. "Click." At a restaurant, I notice that the candlelight flies through a water bottle and creates an interesting pattern on the table. "Click." At a stoplight, I glance over and see beautiful light bouncing off a silver van and onto the face of another driver. "Click."

Don't just look for photo opportunities when you have a camera in your hands. Look for them all the time.

DICCH—THAT'S A CURIOUS WORD

Of course, DICCH is not really a word. Rather it's a mnemonic (memory aide) that will help you remember the five ways I evaluate light: Direction, Intensity, Color, Contrast, and Hardness.

- **Direction:** Where is the light coming from—the front, the side, or behind?
- **Intensity:** How bright is each light source?
- **Color:** What color is the light—white, red, blue…?
- **Contrast:** Is the transition from the highlights to the shadows subtle or sudden?
- **Hardness:** What do the edges of the shadows look like?

As I said above, the best photographers I know are all obsessed with light. You should become obsessed with light, too. I guarantee you that if you learn to see light—I mean truly learn to see light—then your photography will improve automatically.

Truly seeing light is not just a matter of looking. Rather, to truly see light, you have to think about light. Think about the reasons the light looks the way it does. You know, think about DICCH.

DIRECTION

Where is the light coming from—the front, the side, or behind?

The direction of light has a tremendous amount to do with creating a sense of shape and texture in your images. To be a bit more precise, the direction of light controls the width of the shadows. And it's the shadows that create a sense of shape and texture in your photographs.

I tell all of my students, every time I start a workshop:

"If you want to create interesting light, you have to create interesting shadows. So, look at the light and think about the shadows."

Why are shadows important? When we look at a scene, we see depth because the separation between our eyes gives us the ability to see stereoscopically. We see in three dimensions: height, width, and depth. Yet, when your photograph of that scene appears onscreen or is printed on paper, the image only has two dimensions: height and width. Since the screen or paper is flat, the sense of depth in your photographs is created by geometry and shadows. In terms of geometry, we assume that larger objects are closer and smaller objects are farther away. In terms of shadow, the shapes of the shadows go a long way to informing the viewer about the shape of the objects.

THE LIGHTING COMPASS

The placement and width of shadows in a photograph is created by the angle between the camera and the light source. To keep the discussion simple, we'll only consider what happens as the light moves in a circle around the subject.

You, the photographer, control how the camera sees the direction of light through the framing of the shot. If you move your camera in a circle around your subject, you will see that the direction of the light changes as you move. For now, as shown in **Figure 1.1**, let's think of direction as being one of four possibilities:

- **On-Camera or Aligned with the Camera (red):** This means that the sun is coming straight over your shoulders or the flash is parked right on top of your camera. Typically, you will have *flat light* that lacks significant shadows. Photos with flat light often fall short of capturing a scene as you experience it because they lack depth.
- **Angled Towards the Subject (green):** When the light approaches the subject from either side of the camera, shadows are created, and shape/texture become more apparent. The width of the shadows increases as the direction of the light moves from the camera out to the side. You'll find that 45° is a great angle for many lighting situations.
- **To the Side of the Subject (orange):** When the main light comes at the subject directly from the side, you'll have very dramatic light—perhaps too dramatic. Unless there is a fill light or reflector on the other side of the subject, the camera will record the subject as being lit on one side with a dark shadow on the other side. This can be good if you want to create a headshot that conveys mystery, but not so good if you want to convey glamour.
- **Behind the Subject (blue):** Unless you want to create a silhouette shot, light coming from behind the subject should be considered a secondary light. I love shooting with the sun angled from behind my subjects, but I always have to add a source of fill light (either a reflector or a flash) on the front side of the subject. As you will see in Chapter 3, *Using the Light Around You,* a light coming from behind can help create a thin edge of brightness that will separate your subject from a dark background.

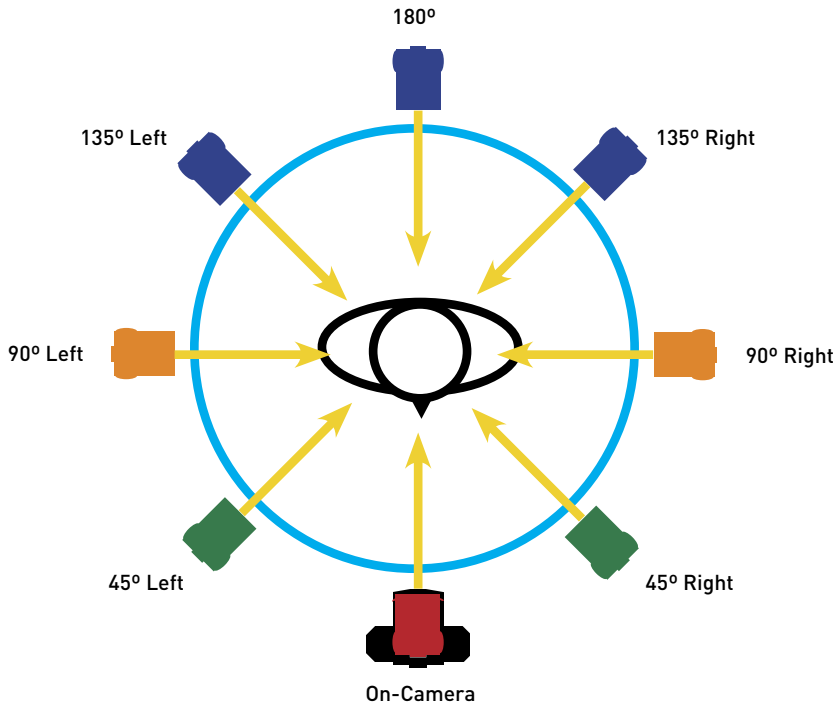


FIGURE 1.1
The lighting compass is a view seen directly above the subject. It shows the angle between the camera and the light source. As you move the light from on-camera out to 90º, the shadows become more pronounced because they become wider. When you move the light behind the subject, you are creating an edge of light that will separate the subject from the background.

FILLING SHADOWS

As good as our cameras are, they cannot record the full range of human vision. If the difference in your scene between the brightest brights and the darkest darks is too much, then some of the details in either the highlights or the shadows (or both) will be beyond the range of the camera. To show details in the dark areas, you can bounce light in with a reflector or add a *fill light*.

LIGHTING LINGO

Key light: The main light hitting the subject, typically coming from the front, often angled in from one side.

Fill light: Light that is added to the shadows, can be created by bouncing light off a reflector or by adding a secondary light, such as a flash.

Rim or hair light: A light that comes from behind the subject and is seen by the camera as a thin outline of light along the edge of the subject.

Let's put these concepts into action. Compare the headshots in **Figures 1.2** and **1.3**. On the left, see how the texture of the shirt is flat? You really cannot see the folds in the fabric. Likewise, the face lacks depth. Now, as shown in Figure 1.3, by moving the light 45° to the right on a small lightstand, I created shadows that add shape to the face and texture to the fabric.

Sometimes you have no control over the location of the light source, such as when shooting outdoors under the sun. In this instance, try circling around the subject so that the camera sees the light falling on the subject from a different angle.

FIGURE 1.2
With the flash sitting in the camera's hotshoe, the lighting appears flat because it lights both sides of Mallory equally.

FIGURE 1.3
Moving the flash off-camera on a lightstand 45° to the right adds depth and texture to the shot because the camera now sees shadows.

DIRECT, DIFFUSED, AND REFLECTED LIGHT

We've just reviewed how the angle between the camera and light affects the shadows in the image. During that discussion, I did not distinguish between *direct*, *diffused*, and *reflected* light. So, now, let's expand the discussion a bit. We need to consider whether the light goes straight from the source to the subject or changes direction along the way.

Direct light flies straight from the light source to the subject (**Figure 1.4**). As we'll discuss later in this chapter, direct light typically creates shadows with high contrast and hard edges. Sunlight on a clear day is direct light. Light from an on-camera flash can also be direct light. While direct light has many uses, photographers often prefer the softer look of diffused and reflected light.

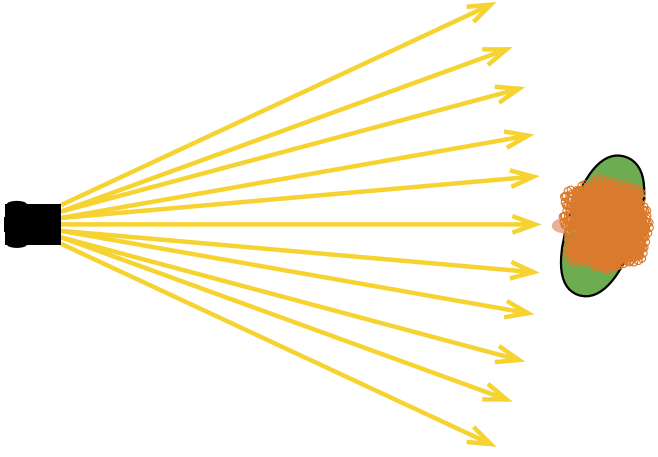
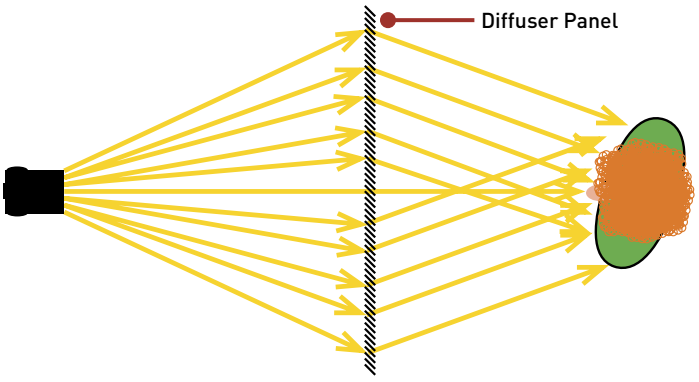


FIGURE 1.4
Light coming directly from a source to the subject will have dark shadows with a hard, defined edge.

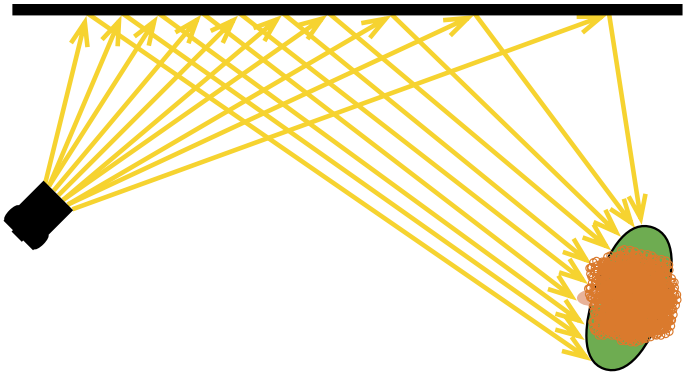
Diffused light passes through a semi-transparent material on the way from the source to the subject (**Figure 1.5**). Diffused light creates shadows with lower contrast and softer edges than direct light. Depending upon the amount of diffusion, it is possible that the shadows will be so light that you can barely see them. Clouds are a great example of how sunlight can be diffused. The water vapor causes the light to bounce around and come at the subject from many angles rather than directly from the sun. A sheer curtain over a window is another example of a light diffuser.

FIGURE 1.5
Light that passes through a semi-transparent material, like a cloud bank or diffuser panel, will come at the subject from many angles. This light will have soft shadows.



Reflected light bounces off of an opaque surface before it hits the subject (**Figure 1.6**). Sunlight bouncing off the concrete wall of a building is reflected light. Sunlight bouncing off of clouds can create reflected light. Photographers can use white *foam core* panels or fabric *reflectors* in a variety of colors to bounce light. Hotshoe-mounted flashes often have the ability to tilt and pan so that the flash can be bounced off a nearby wall or ceiling. Like diffused light, reflected light is softer than direct light.

FIGURE 1.6
Light that bounces off a surface, like a white wall or ceiling, will also come at the subject from many angles and have soft shadows.



The difference between diffused and reflected light comes from the location of the diffuser and reflector. With diffused light, the diffuser is between the light source and the subject. With reflected light, the light hits a nearby surface and then bounces onto the subject. This is why clouds can be both diffusers and reflectors. When the sun's light goes through the clouds, they are a diffuser. When the light reflects off of the clouds—such as when the sun is setting low in the sky—then the clouds serve as reflectors.

As you will shortly read in the section on Hardness, diffused and reflected light is *softer* because the diffusion or bounce increases the *apparent size* of the light source. I know that this does not make sense to you now, but it will soon. The point to remember is that you should think about whether the light is direct, diffused, or reflected. If it is direct, then you may have options to create softer light by using a diffuser or reflector.

INTENSITY

How bright is each light source?

Of the five elements of DICCH, intensity is the easiest to understand and, I'll wager, the one given the least creative consideration. So, rather than think of a light source as being just bright or dim, think of it in terms of the many ways that its intensity can affect your shot.

A camera's exposure settings (shutter speed, aperture, and ISO) are based largely on the overall intensity of the light in the scene. For any given amount of light, there are many combinations of shutter speed, aperture, and ISO that can be used (these are called *equivalent exposures*). These three camera settings work in opposite directions—meaning that if you change one to be bigger/faster, then you have to change another to be smaller/slower to keep the overall exposure the same. Once you know the basics, you'll start to see the creative opportunities.

For instance, *depth of field* describes how much of your image appears to be in focus from front to back in the scene. A wide aperture, such as f/2.8, lets in lots of light and creates shallow depth of field. Conversely, a narrow aperture, such as f/22, only lets in a small amount of light and creates deep depth of field. So, if you don't have much light intensity and you want to create deep depth of field, then you'll have to use a slow shutter speed (which might cause camera shake) or a high ISO (which might cause digital noise in the image). If neither of these options works, then you'll need to increase the intensity of the light.

FINE-TUNING SHADOWS

If you have multiple light sources, then their intensities will affect the *contrast* in your image—which, as we'll discuss in just a bit, is the difference between the bright and dark areas of your shot. Typically, contrast is created because the intensity of light is greater on one side of the subject than another. Put another way, if your image appears flat, then you can either reduce the intensity of light on one side

or increase the intensity of light on the other to increase contrast. The contrast is increased because you are creating more shadows.

In **Figure 1.7**, I've arranged two lights, each placed at 45° to the left and right of Mallory, and set them so that they have the same power. As you can see, her face lacks shape—because it lacks shadows that reveal shape. Then, in **Figure 1.8**, I reduced the power on the left light so that it is one quarter as bright (i.e., I reduced it by two stops). Now, the lower intensity allows more shadowing and thereby shows more shape.

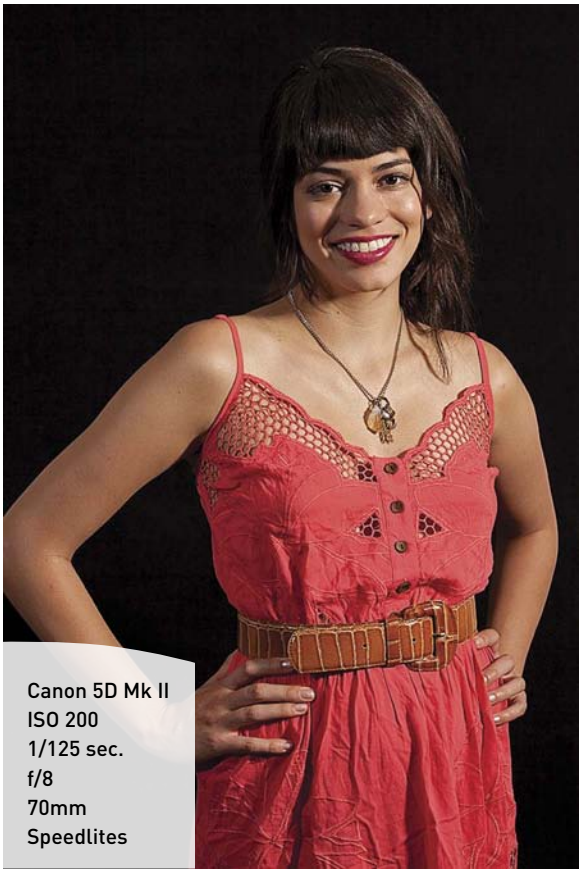


FIGURE 1.7
Here I have set two lights angled towards the subject from 45° on the right and left. They are the same distance away and set at the same power. The shot lacks shadows and depth because both sides of the model are lit equally. This is basically the same as shooting with your on-camera flash.

FIGURE 1.8
Dimming the light on the left by two stops allows more shadows to be created by the light on the right. Actually the shadows were there before. The camera could not see them because of the intensity of the light on the left.

If you are wondering how this is different than the photos in Figures 1.2 and 1.3, here I have used two lights. In Figures 1.2 and 1.3, I used a single light. What I want you to learn is that, when you are crafting shadows, the intensity of a light is as important as its position.

DISTANCE AND INTENSITY

The simple truth is that as light travels farther, it spreads out. As it spreads out, it gets dimmer. This is what the mathematics of the *Inverse Square Law* describes. So, even if you're not a math whiz, remember this: one way to make a light appear brighter is to move it in closer. Likewise, to make it dimmer, you can move it farther away. As we'll discuss in the section on Hardness, moving a light in or out also affects the edges of the shadows.

COLOR

What color is the light—white, red, blue…?

The color of light in your photographs provides significant clues to your viewers about the shot. You were there. You experienced the moment as you pushed the shutter button. The viewer only has the details and information within the frame. So, know that color can go a long way to affect the mood of your images. Sometimes you can change the color of light in your shot for creative effect. Other times, you have to capture the light as you see it.

COOL LIGHT/WARM LIGHT

A basic way to describe color is to say that it is either cool or warm. Cool colors include green, blue, and purple. While cool light can be perceived as calming, it can also be perceived as cold or depressing. Likewise, green can suggest a pastoral setting, but it can also suggest immense wealth.

Warm colors live on the other side of the color wheel. They are red, orange, and yellow. Warm light is perceived as being comforting. Warm skin tones are seen as a sign of health. However, intense red can be seen as the color of anger and also passion.

When we speak of light as being either cool or warm, usually we are describing a slight tint to the light and not saying that the light is strongly blue or orange. As shown in **Figures 1.9** and **1.10**, the same scene can have two completely different looks based on the time of day that it was shot. In Figure 1.9, the photo has a cool

tint because it was shot with the sun just below the horizon. Figure 1.10 was shot a few minutes after the sun rose above the horizon. In the following chapter, we will talk in detail about how the time of day influences the color of light.

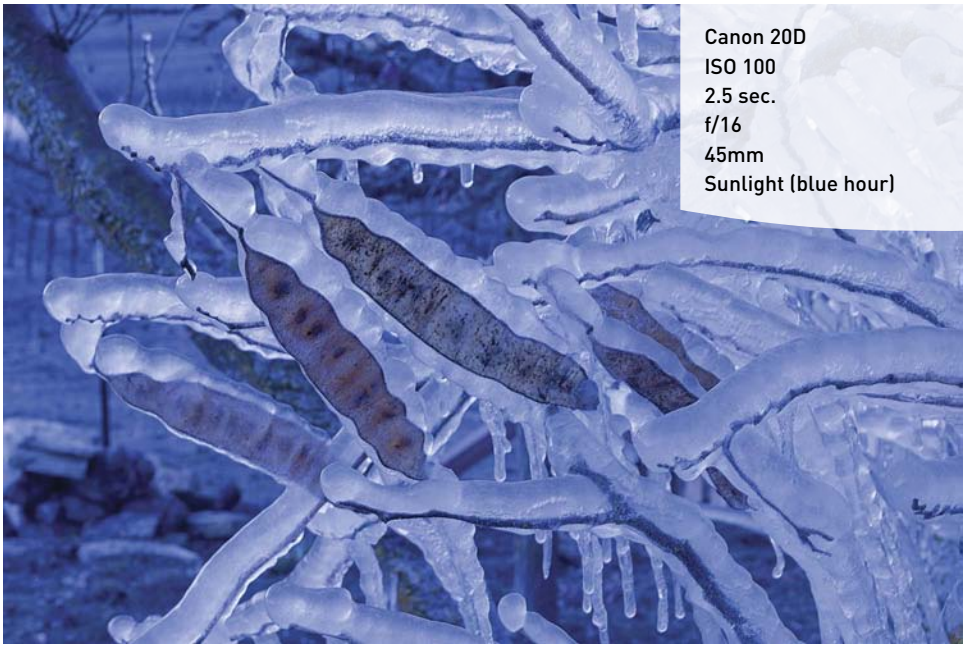


FIGURE 1.9
Shooting just before sunrise (during the blue hour) creates a cool tint to the image because the sunlight is reflecting off of the upper atmosphere.

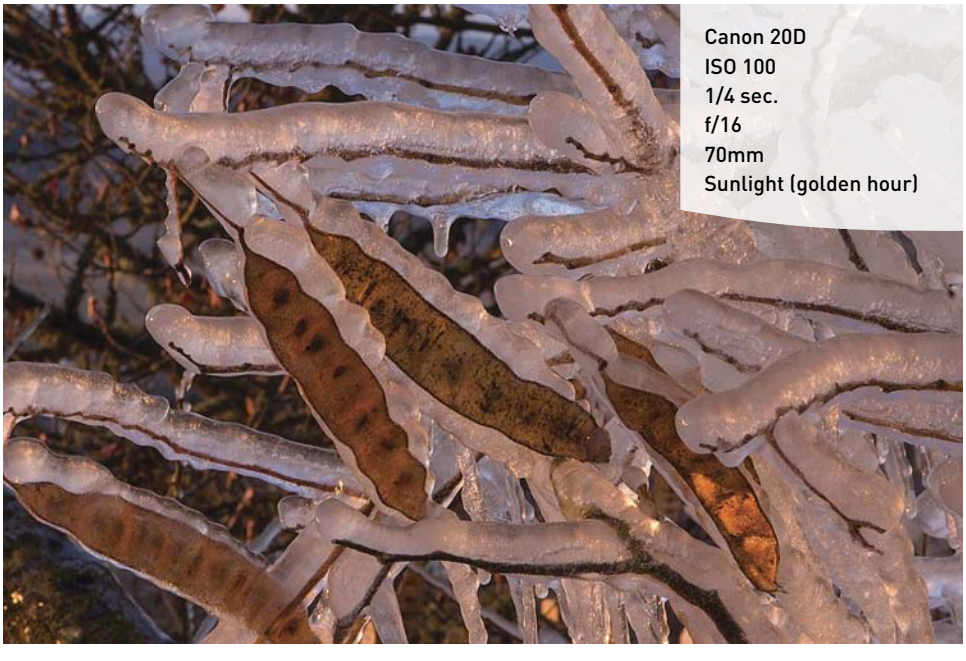


FIGURE 1.10
A few minutes later, when the sun crests above the horizon, the light takes on a golden glow—which is why photographers call this time the golden hour.

COLOR TEMPERATURE OF LIGHT SOURCES

Color temperature refers to how blue or yellow a light source appears. The surprising thing is that low color temperatures describe yellowish light, and high color temperatures describe bluish light (**Figure 1.11**). Yet, we talk about yellow as being a warm color and blue as being a cool color. This is one of those photo-opposites—just like it's surprising when you first learn that an f-stop with a small number is actually a large aperture opening. Scientists and lighting designers have very precise reasons for why this is so. I just accept it as stated. My mnemonic is that somewhere in my youth I learned that the blue part of a flame is hotter than the yellow part. So, light with a high color temperature is bluer than light with a low color temperature.

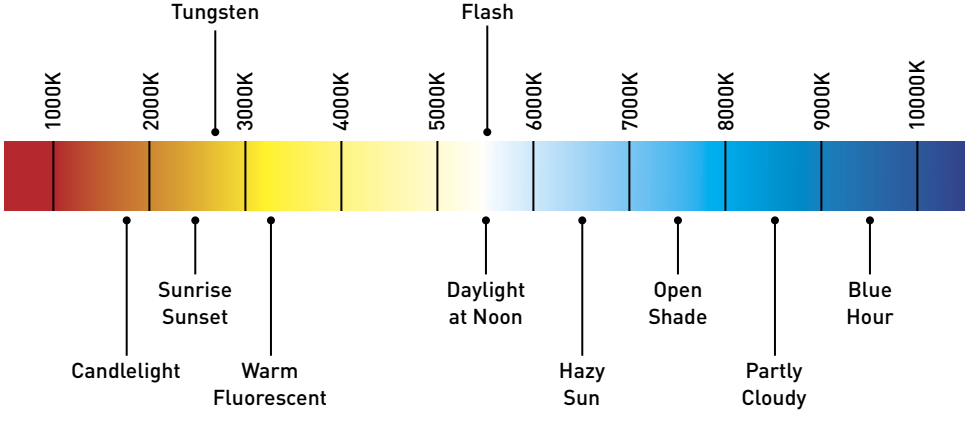


FIGURE 1.11
Color temperature describes how yellow or blue a light source appears. The unit of measurement for color temperature is "Kelvin" (not "degrees Kelvin," as you may hear some say).

In a practical sense, you know that candlelight has a very warm (yellowish) color. What you might not know is that the color of open shade is very blue. Our eyes and brain work together to turn the brightest part of a scene to white. This is why, when you look at a white shirt or a piece of white paper under an old-school incandescent bulb, they look white rather than yellow-orange. Then, when you walk outside into the open shade on the north side of your house, the paper and shirt still look white. In this sense, our eyes and brain are much smarter than our digital cameras.

White balance is the camera setting that overcomes the color cast of a particular light source. As we will discuss in detail in Chapter 2, matching the camera's white balance to the light source will mean that whites are captured as white rather than as lightly amber or slightly blue.

COLOR GAMUTS

Any range of colors can be described as a *gamut*. There is a gamut of colors that you can see, a gamut of colors that your camera can record, a gamut that your monitor can display, and a gamut that your printer can print. To paint a simpler picture, I like to think of each of these gamuts as a box of crayons. As you'll see below, the box of crayons gets smaller as you move through the image-making process. This is one of the reasons why a photograph of a richly colored sunset did not look as beautiful as the actual sunset.

Without getting too technical, I want you to understand the limitations imposed by our gear. So, in **Figure 1.12**, I've made a graph that compares the range of human vision to three key pieces of gear used to create the images in this book. The yellow line shows the range of colors that my camera can record. The white line shows the colors that my monitor can display. The orange line shows the gamut of CMYK commercial printing used to print books and magazines.

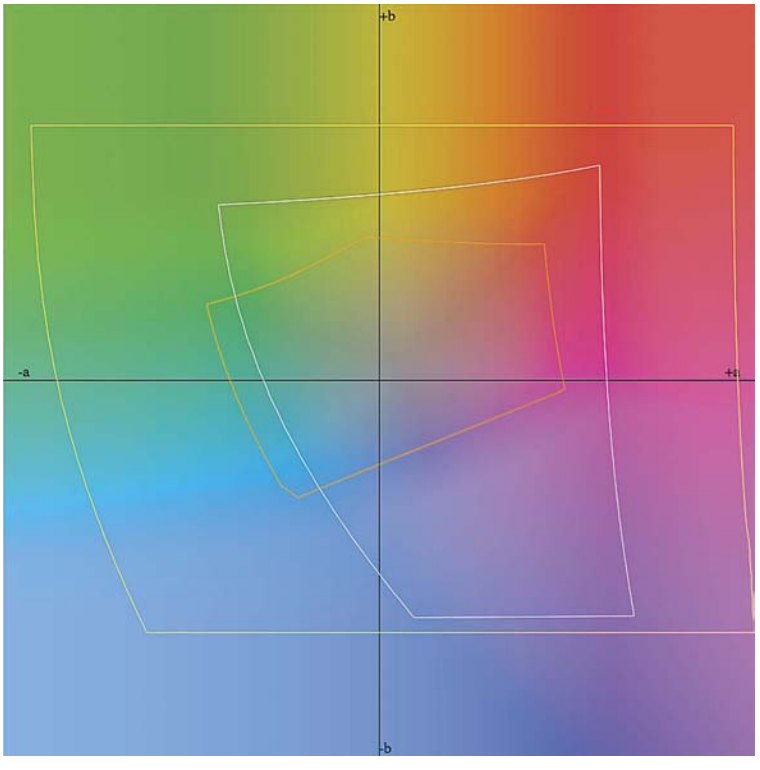


FIGURE 1.12
This gamut graph shows how human vision (the entire box) compares to the range of colors that can be captured by my Canon 5D Mark III camera (yellow), displayed on my Apple iMac monitor (white), and then printed in this book through CMYK printing (orange).

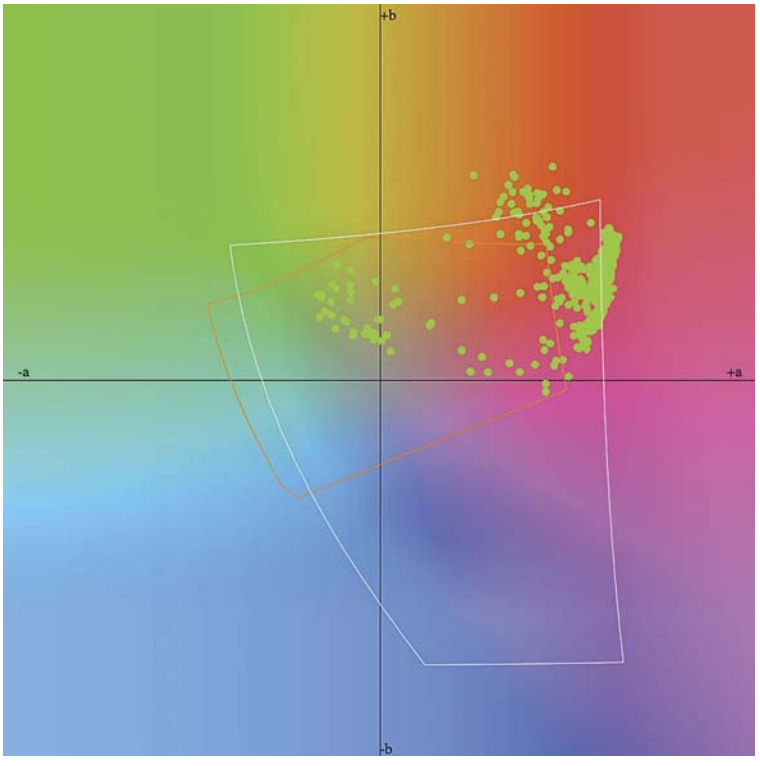
Now, take a look at the flowers in **Figure 1.13**. When I made this photograph, I was impressed by the super-saturated magenta of the petals. Take my word for it, the gamut of CMYK printing used to print this book falls far short of the vibrancy that I experienced in the garden. They screamed "PINK!"

FIGURE 1.13
The super-saturated magenta of these landscape roses is beyond the gamut of the CMYK inks used to print books, magazines, and catalogs. So, the color and texture of the petals is less vibrant than they actually were when I shot the photo.

Taking a look at **Figure 1.14**—a gamut graph of the photo in Figure 1.13—will help us understand what is going on. The green dots show the range of colors in my original capture (the original shot). You'll note that there is a large group of green dots outside the CMYK gamut (the orange box), which explains why I think that the colors look dull here. It is also interesting to note that there are many dots that fall outside the gamut of my monitor (the white box). So, while my camera was able to capture a wide range of color, I could not see many of the rich pinks on my monitor, nor are they reproduced in this book. This is why the photograph printed here is much less colorful than the flowers themselves—their gamut was beyond the range of colors that can be reproduced on a typical printing press.

FIGURE 1.14

This gamut graph shows the range of colors in the photo as green dots. The big cluster outside the orange box represents the colors outside the CMYK gamut. The green dots outside the white box are colors captured by my camera that cannot be displayed on my monitor.



So, if you've ever shot a photo of a sunset or a flower that lacks the beauty that you actually experienced, it is likely that the scene contained colors that just could not be captured or printed. Don't despair. Obviously, beautiful photographs are created and printed every day. As photographers, though, we need to be aware of the limitations of our gear and the opportunities to use lighting as a way to overcome these limitations. Also, know that the technology of image-processing software gets better every year. I've no doubt that someday I will be able to print the full range of colors that I saw in those roses.

WHY I NO LONGER WORK IN BLACK AND WHITE

As far as I'm concerned, the greatest miracle of human vision is that we see in color. So, I'm going to jump up on my soapbox (again) and say that I have no interest in doing black-and-white photography. I think it's okay if you have no interest in black-and-white either.

As a guy who spent years in photo school, long before the digital era, I made too many black-and-white photographs—mostly because working in color was expensive and hard to control. I think that most of the 20th-century masters who influenced me at the time—guys like Edward Weston, Ansel Adams, and Minor White—worked in black-and-white for the same reason.

Today, with our digital cameras, computers, and printers, color photography is as affordable and controllable as black-and-white. Further, and I say this quite seriously, if black-and-white is such an important way to communicate, then why did master painters, from Michelangelo to Rembrandt to Cézanne work primarily in color? I think they painted in color because that's how they saw the world.

Again, I say that color vision is a miracle. Embrace that gift in your photography.

CONTRAST

Is the transition from the highlights to the shadows subtle or sudden?

Contrast describes how the highlights transition into the shadows. The brightest areas of the image are the *highlights*. The darkest areas are the *shadows*. In between, the image will have *lights*, *midtones*, and *darks*.

Check out the Poring Over the Picture spread on pages 2–3 (the one of Tony at the lake). You will see that I noted that I exposed the image such that the details of the hair highlights would not blow out to white. This meant that the details in the shadow are too dark (at least too dark for a perfectionist). So, you could say that this image has too much contrast.

DYNAMIC RANGE

The *dynamic range* of a scene describes how much brighter the brightest spot is than the darkest spot. The human eye can see a wider dynamic range than our cameras can record. Likewise, our cameras can record a wider dynamic range than our monitors can display and, typically, our monitors can display a wider range of light than printers can print. Every generation of gear narrows the gap between what we

see and what it can capture, display, or print. Eventually, I expect that this gap will become a non-issue. In the meantime, as this is a book on lighting, throughout the many pages ahead, we will discuss how to manage these differences by adding light to and, in some cases, subtracting light from our shots.

Here is a quick example of how lighting can adjust the dynamic range of a scene so that the camera can record it more faithfully (**Figures 1.15** and **1.16**). A car outdoors on a sunny day has a huge dynamic range. The glints of light coming off the chrome are the brightest highlights—in fact, they are so bright that we call them *spectral highlights*, meaning that they are direct reflections of the light source (in this case, the sun). At the other end of the dynamic range are the shadows—in this case, the treads of the tires just where they meet the asphalt.

FIGURE 1.15
Even though I could distinctly see the difference between the tire and the asphalt, there was too much dynamic range in this scene. Exposing to see the tire details would have blown out important highlights.

FIGURE 1.16
Adding light into the shadows actually reduces the dynamic range of the scene. In this shot, I used a pair of Speedlites to add light underneath the fenders.

In direct sunlight, there is often too much contrast. Here the details in the shadows of the tire treads merge to black. We might be able to see most of the details between the two extremes. Yet, as shown in Figure 1.15, the camera cannot record this full range of light and shadow. So, as the photographer, I decided to expose for the detail in the hood and let the shadows fall where they may. As you can see, the tread of the tires cannot be distinguished from the wheel well or from the asphalt.

As we will explore in greater detail later in the book, one option is to add light into the shadow areas so that the dynamic range of the scene is reduced to the range that the camera can record. In Figure 1.16, you can see can see many more *shadow details* because I used two Speedlites to create fill flash (**Figure 1.17**).

FIGURE 1.17
By adding fill flash, the contrast is reduced into the dynamic range that the camera can record. So, shadow details are revealed.

EXPOSURE AND POST-PROCESSING

When the difference between the highlights and the shadows is beyond the dynamic range of the camera, then either some of the highlight details will be captured as pure white, some of the shadow details will be captured as black, or both will happen. We call this *blowing out the highlights* and *crushing the shadows*.

In the field, you will often have to decide what is most important and skew your exposure to protect that portion of the image. For a wedding portrait, the details of the bride's dress are likely more important than the details of the groom's tuxedo. So underexposing a bit to preserve the highlight detail in the dress would be a safe decision.

In Chapter 2, we will talk about the benefits of shooting RAW files instead of JPEG files as one way to maximize your options for challenging shots with a wide dynamic range. Then, by using a full-featured image-processing program—like my favorite, Adobe Lightroom—you can often save important highlight details with the Highlight slider and reveal details in the shadows with the Shadows slider (**Figure 1.18**).

FIGURE 1.18
In the Develop module of Adobe Lightroom, the sliders for White Balance, Tone, and Presence can go a long way to restoring the look of a poorly exposed capture. Still, using software to fix problems is no substitute for learning to light.

HARDNESS

What do the edges of the shadows look like?

You will recall that, near the beginning of the chapter, I said, "Look at the light and *think* about the shadows." The shadows will reveal many details about the lighting. For instance, you can draw a line from a point on a shadow to the spot that created it and you'll see the direction of the light source. You can also examine the edges of the shadows and learn if the light source was small or large.

HARD AND SOFT SHADOWS

Think about the shadows! Are they defined sharply—like your shadow on a sunny day? Or are the edges fuzzy—like your shadow on a cloudy day? Photographers call a light that creates a sharply defined shadow a *hard light* and a light that creates shadows with fuzzy edges a *soft light*. In **Figures 1.19** and **1.20**, you can see the difference between hard and soft shadows.

FIGURE 1.19
I lit this shot with a single Speedlite at 45º right. Because the flash was smaller than the bunch of flowers, it created many hard-edged shadows within the shot.

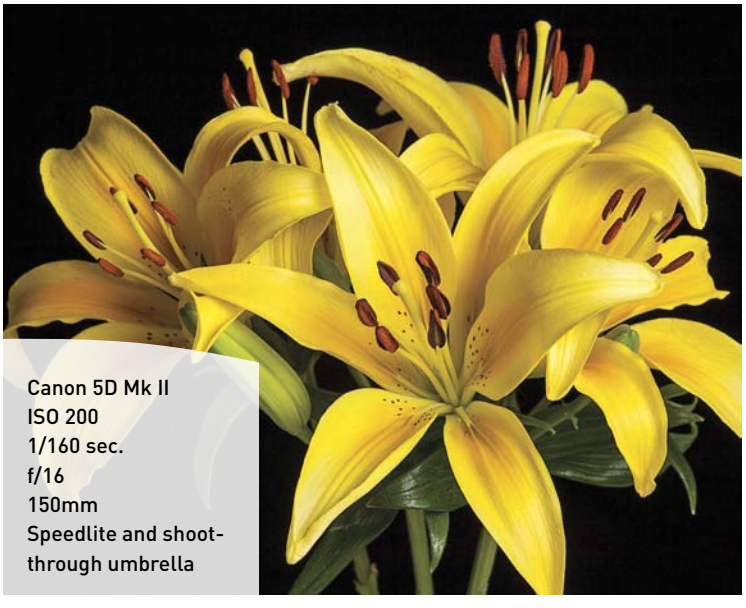


FIGURE 1.20
Without moving the Speedlite, I added a shoot-through umbrella between the flash and the flowers. This increased the apparent size of the light source so that it could send light at the subject from multiple angles. As you can see, all of the hard shadow edges have disappeared.

Hard shadows are created when the size of the light source is small when compared to the size of the subject. Astronomers tell us that the size of the sun is huge. Yet, Earth's distance from the sun makes it appear relatively small in our sky. So, on a sunny day, your shadow has hard edges.

Conversely, soft shadows are created when the size of the light source is larger than the subject. Let's say that, while you are admiring your hard-edged shadow on the sidewalk, a bank of clouds drifts between you and the sun. You notice that the edges of your shadow become very soft. What causes this? Essentially, the clouds replaced the sun as the light source. Sure, the light originated at the sun. But, as it traveled through the mist of the clouds it bounced around. So instead of the light coming at you from one direction (the sun), the light came at you from many directions (the clouds).

As photographers, we have many tools to increase the *apparent size* of our light sources: reflector disks, diffusion panels, umbrellas, and softboxes—all of which will be covered in later chapters. For now, review Figures 1.4–1.6 to make sure that you understand the differences between direct, diffused, and reflected light. In your photos, the differences will be revealed by the shadows.

LIGHTING LESSONS ARE EVERYWHERE

After you've learned the five characteristics of light, begin to decode the light that you see around you and in the media. Ask yourself questions like, "Why is that shadow line soft?" or "What could have created that thin slice of light that outlines the left side of the face?" There are lighting lessons everywhere—waiting for you to think about them. Here are some sources to look at:

- **Magazine ads**: Publishers and advertisers spend huge sums of money styling the people and products that appear in magazines. Fashion magazines like *Vogue* and *Harper's Bazaar* are filled with expensive ads and stories that are beautifully styled and lit. Likewise, lifestyle magazines like *Martha Stewart Living* and *Real Simple* are a treasure trove of high-quality images. No matter what your interest, clip images that you like and collect them in an "inspiration binder."
- **Movies**: Much of what I know about lighting comes from studying the tools and concepts that Hollywood uses to light movie sets. Every time you watch a movie, you have lighting lesson after lighting lesson playing in front of you. Be sure to check the bonus features on DVDs and Blu-ray Discs for behind-the-scenes stories about how the movie was made.

- **City streets**: I love walking around Manhattan and looking at the light. The skyscrapers may create canyons for those on the street, but the glass and stone facades provide huge reflective surfaces that enable sunlit to cascade down in magical ways. The next time that you find yourself at a big city intersection, look around. Do the pedestrians have hard shadows because the sun is bouncing down between two tall buildings? Or perhaps each person has multiple shadows heading in different directions?

Chapter 1 Assignments

Direction—Exploring the Compass

Put your camera on a tripod and point it at a patient friend sitting on a stool. Then, using a hard light source (shop light, small flash, etc.), make a series of headshots with the light circling around the subject so that you can see how the position of the light changes the shadows.

Intensity—Creating Shape by Dimming the Light

Light a friend or an object with a pair of identical light sources. Position them 45° to the left and right of your subject so that the light is balanced. Take a shot. Now, turn down one light or move it farther back. Take another shot. How does the appearance of the subject change between the two shots?

Color—Setting White Balance on Your Camera

Set your camera's white balance to Daylight. Photograph a friend or an object under several different light sources. Does the color of the image change as the source changes? Repeat the series with your camera set to Auto White Balance.

Contrast—Filling Shadows to See Detail

Photograph a friend or an object under direct sunlight—with the sun coming from behind the subject. Now turn on your camera's flash or use a white card to bounce light into the shadows. Make another photograph. How does the detail in the shadows change?

Hardness—Making Soft Light from Hard Light

Photograph a friend or an object with a direct (hard) light source. Now diffuse the light by putting a semi-transparent material between the light and the subject. A white sheet or a white garbage bag should work. How do the edges of the shadows change as you modify the apparent size of the light source?

Share your results with the book's Flickr group!

Join the group here: flickr.com/groups/lightingfromsnapshotstogreatshots

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