Working with Shadows

Typically, you add shadows to a SketchUp drawing for two key reasons:

- **To display or print a model in a more realistic way:** Turning on shadows adds depth and realism, and gives your model an added level of complexity that makes it look like you worked harder than you really did.
- **To study the effect of the sun on what you've built (or plan to build) in a specific geographic location:** Shadow studies are an integral part of the design of any built object. If you're making a sunroom, you need to know that the sun is actually going to hit it, no? You can use SketchUp to show exactly how the sun will affect your creation, at every time of day, on every day of the year.

In this section, we start with a brief, nuts-and-bolts description of how all the controls work, without diving too much into why you'd want to pick one setting instead of another. The second part of this section is devoted to running through each of the preceding scenarios and using the controls to make SketchUp do exactly what you want it to.

Discovering the shadow settings

The basic thing to understand about shadows in SketchUp is that, just like in real life, they're controlled by changing the position of the sun. Because the sun moves exactly the same way every year, you just pick a date and time, and SketchUp automatically displays the correct shadows by figuring out where the sun should be. Hooray for math!

You do all these simple maneuvers in the Shadows panel, as shown in Figure 10-13. The sections that follow introduce how the controls work so you can apply them to your model.

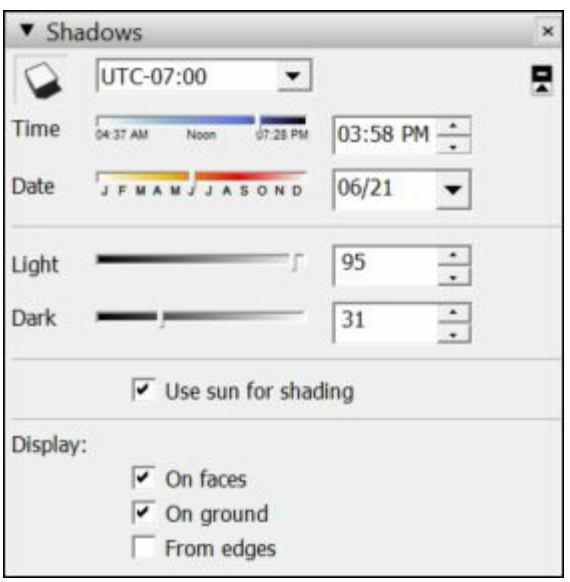

FIGURE 10-13: Dial up the sun in the Shadows panel.

Turning on the sun

Shadows aren't turned on by default, so the first thing you need to know about applying shadows is how to turn them on. Follow these simple steps:

1. **Open the Shadows panel by choosing Window ⇒ Default Tray ⇒ Shadows (Windows) or Window ⇒ Shadows (Mac).**

2.  **In the upper-left corner of the panel, click the Show/Hide Shadows button.**

   Clicking it turns on the sun in SketchUp, casting shadows throughout your model and, generally speaking, making everything much more exciting.

Setting a shadow's time and date

The Shadows panel has time and date controls, which you use to change the position of the SketchUp sun. The time and date you choose, in turn, controls the appearance of shadows in your model:

- **Setting the time:** You don't have to be Copernicus to figure out how to set the time of day; move the Time slider back and forth, or type a time into the little box on the right. Notice the times at each end of the slider? These represent sunrise and sunset for the day of the year you've set in the Date control, described in the next bullet point.
- **Setting the date:** Just like the time of day, you set the day of the year by moving the Date slider back and forth, or by typing in a date in the little box on the right. If you slide the Date control back and forth, notice that the sunrise and sunset times change in the Time control, in the preceding point.

TIP To toggle open or closed the extra shadow controls, click the triangular Expand button in the upper-right corner of the Shadows panel.

Choosing where shadows appear

The Display check boxes in the Shadows panel enable you to control *where* shadows are cast. Depending on your model, you may want to toggle these on or off.

- **On Faces:** Deselecting the On Faces check box means that shadows aren't cast on faces in your model. This is on by default, and should probably be left on, unless you want to cast shadows only on the ground. For what it's worth, we always have it selected.
- **On Ground:** Deselecting the On Ground check box causes shadows not to be cast on the ground plane. Again, this is on by default, but sometimes you want to turn it off. A prime example is when something you build extends underground.
- **From Edges:** Selecting the From Edges check box tells SketchUp to allow edges to cast shadows. This applies to single edges that aren't associated with faces — things like ropes, poles, and sticks are often modeled with edges like these.

Adding depth and realism

The neat thing about shadows in SketchUp is how easily you can apply them — and how easy they are to adjust. In the previous sections, you find a dry rundown of the basic controls in the Shadows panel. In the following sections, you learn how to use those controls to add depth, realism, and delicious nuance to your models. If only Caravaggio had had it so good …

You often need shadows to make your drawings read better, especially in the following instances:

- **Indoor scenes:** The sun is the only source of lighting that SketchUp has, so any shadows you use in interior views have to come from it.
- **Objects that aren't in any particular location:** For things like cars and furniture, it doesn't matter that the shadows are *geographically accurate;* all that matters is that they help make your model look good.
- **2D views:** Without shadows, reading depth in 2D views of 3D space is next to impossible.

Lighting indoor spaces

Adding shadows to interior views presents an interesting problem: Because SketchUp has no lights besides the sun, how are you supposed to make anything that looks halfway realistic? With a ceiling in your room, everything's dark. If you leave off the ceiling, your model looks ridiculous. Don't despair — here are some tricks:

- **Decrease the darkness of the shadows.** Sliding the Dark slider to the right brightens your view considerably. You can still see the shadows cast by the sun coming through windows and other openings, but the whole room won't look like something bad is about to happen. Check out Figure 10-14.
- **Make an impossible ceiling.** As long as you haven't modeled anything on top of the interior you're planning to show, you can tell the ceiling not to cast a shadow. That way, sunlight shines directly onto your furniture, casting gloriously complex shadows all over everything.

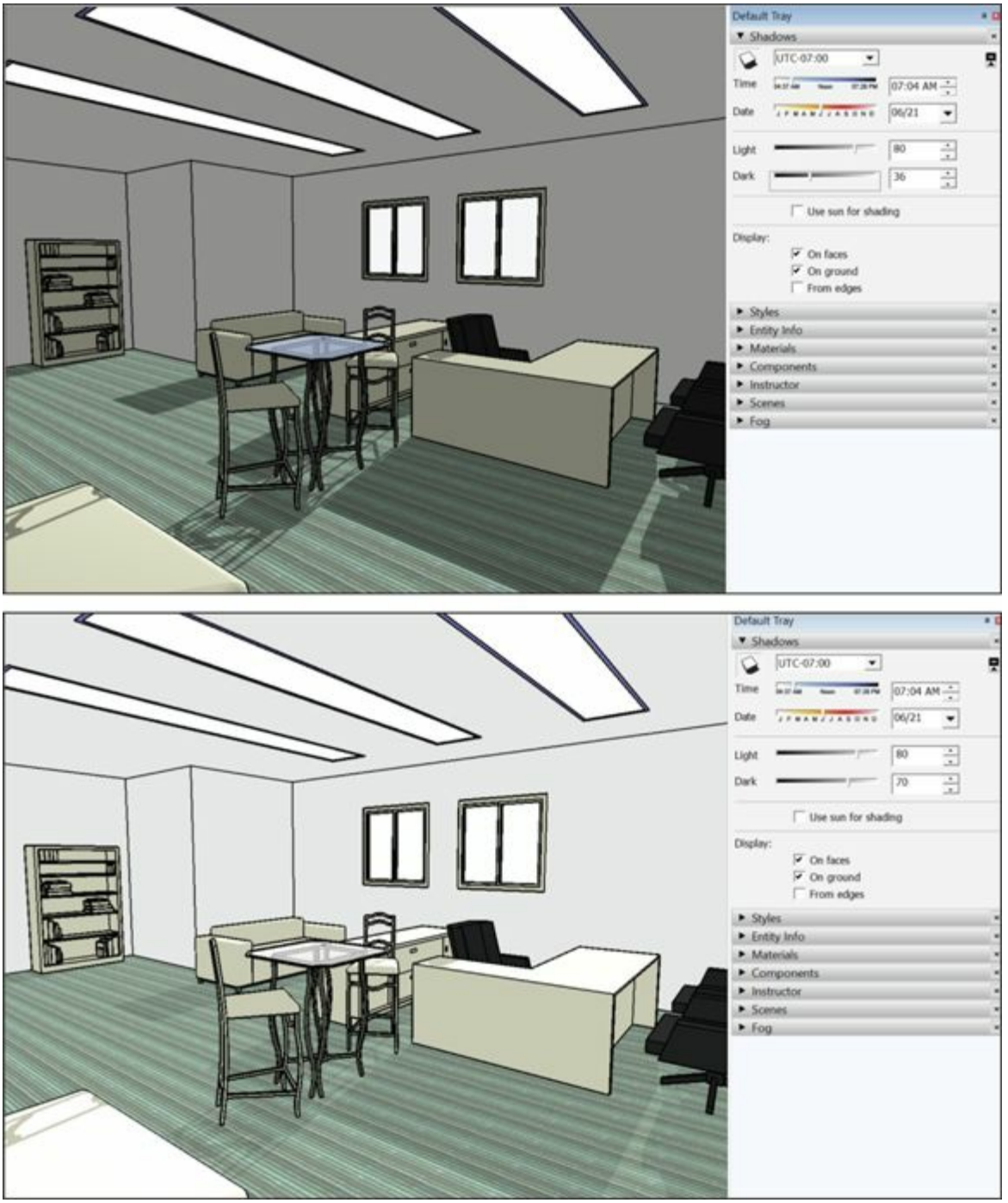

FIGURE 10-14: Brighten the room by decreasing the Dark slider.

Figure 10-15 shows this ceiling method in action. To create this effect yourself, follow these steps:

1. **Adjust the settings in the Shadows panel until the sun shines through one or more windows in your view.**

   This ensures that shadows cast by objects in your room look like they're caused by light from the

windows.

TIP To make it seem like overhead lighting is in your space, set the time of day to about noon and the date to about the end of June. The shadows cast by furniture and similar objects will be directly below the objects themselves. One more thing: If you have lighting fixtures on the ceiling, remember to set them not to cast shadows in the Entity Info panel (read on).

2. **Open the Entity Info panel by clicking its right-pointing arrow in the Default Tray (Windows) or choosing Window ⇒ Entity Info (Mac).**
3. **Select any faces that make up the ceiling.**

   Hold down the Shift key to select more than one thing at a time.
4. **In the Entity Info panel, deselect the Cast Shadows check box.**

   

   The ceiling now no longer casts a shadow, brightening your space considerably. If you don't see the Cast Shadows checkbox, click the Show Details icon in the upper right.
5. **Repeat Steps 3 and 4 for the following faces and objects:**
   - The wall with the windows in it
   - The windows themselves
   - Any walls in your view that cast shadows on the floor of your space
6. **Move the Dark slider to about 50.**

   This brightens things even more and makes your shadows more believable.

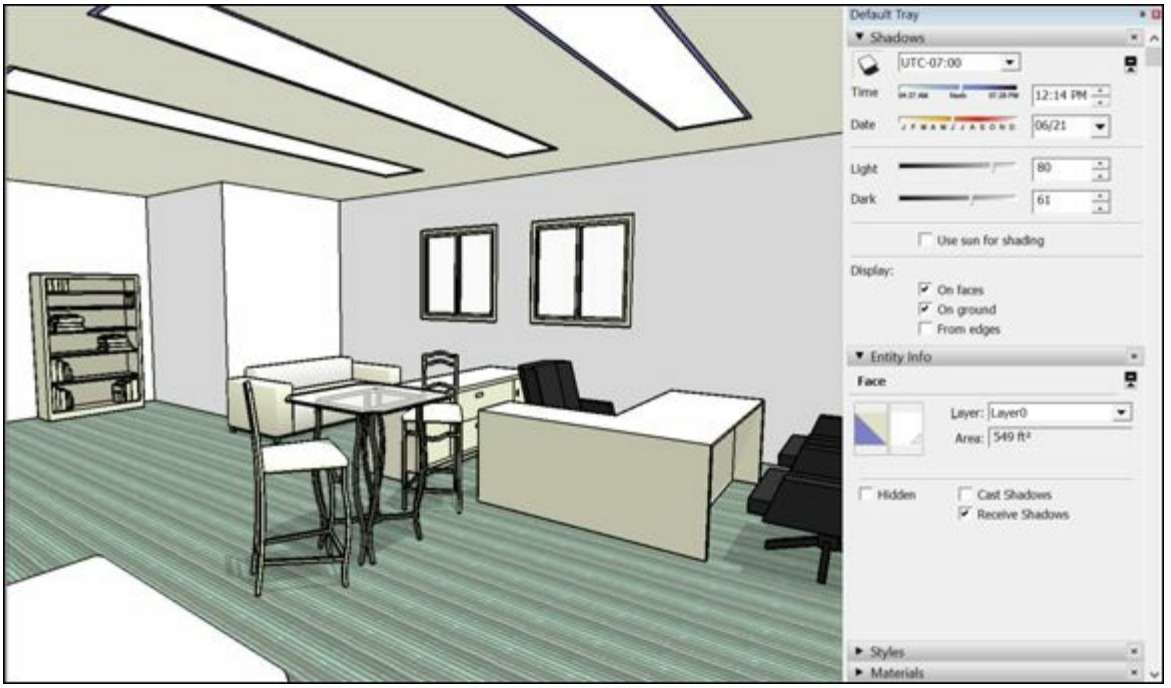

FIGURE 10-15: Tell the ceiling not to cast a shadow.

Making 3D objects pop

Adding shadows to freestanding things like tables, lamps, and pineapples is a mostly aesthetic undertaking; just fiddle with the controls until things look good to you and you'll be okay. Keep the following tips, illustrated in Figure 10-16, in mind:

- **Take it easy on the contrast** — especially when it comes to very complex shapes or faces with photos mapped to them. When your model is too contrasty and dramatic, it can be hard to figure out what's going on. To decrease the contrast
    1. *Move the Dark slider over to about 40 or 50.*
    2. *Move the Light slider down to 60 or 70.*
- **Shorten your shadows.** It's strange to see objects lit as though the light source is very far away; overhead lighting looks more natural. To make your shadows look better, follow these steps:
    1. *Set the Date slider to a day in the early autumn.*
    2. *Set the Time slider to a time between 10:00 a.m. and 2:00 p.m.*

- REMEMBER **Don't be afraid to rotate your model.** Remember that you can't get every possible shadow position by using only the controls in the Shadows panel. To get the effect you want, you may have to rotate your model by selecting it and using the Rotate tool.

- **Select the From Edges check box.** Lots of times, modelers use free edges to add fine detail to models (think of a harp or a loom). Selecting the From Edges check box tells SketchUp to allow those edges to cast shadows, which makes complex objects look about 900-percent cooler.
- **Pay attention to the transparency of faces.** When you have a face painted with a transparent material, you can decide whether that face should cast a shadow — chances are that it shouldn't. In SketchUp, the rule is that materials more than 50-percent transparent cast shadows. So, if you don't want one of your transparent-looking faces to cast a shadow, do one of the following:
    - *Select the face and then deselect the Cast Shadows check box in the Entity Info panel.*
    - *Adjust the opacity of the face's material to be less than 50 percent in the Materials panel.* For more information on how to do this, have a look at Chapter 3.

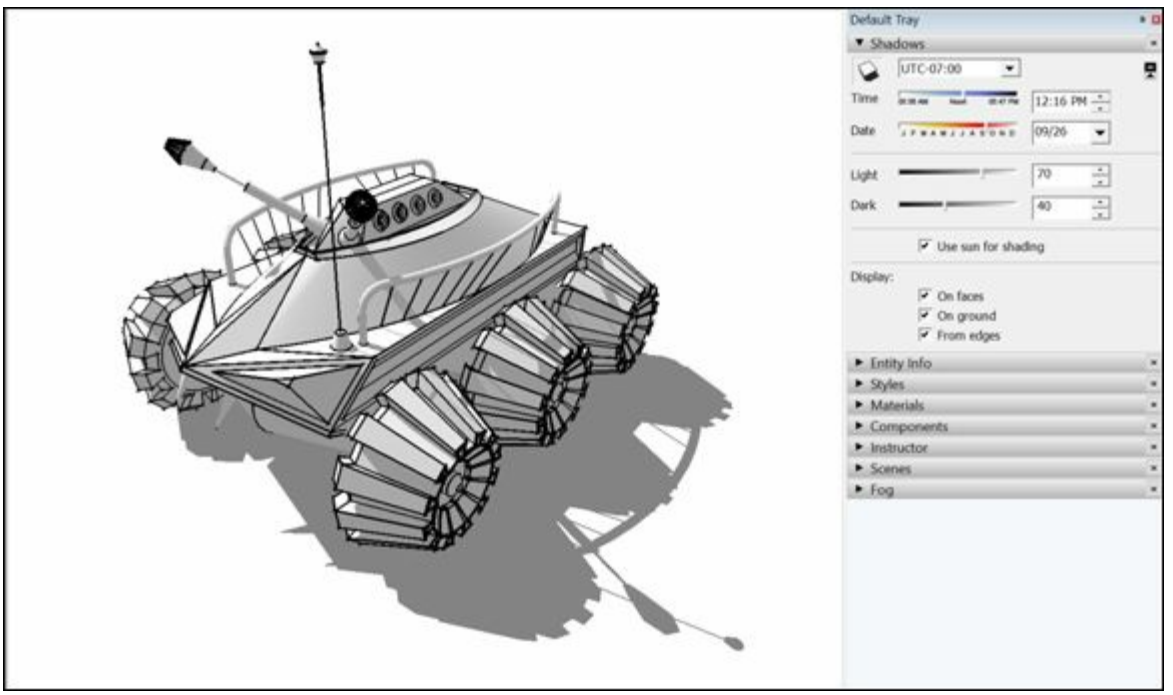

FIGURE 10-16: Some tips for making objects stand out with shadows.

Creating accurate shadow studies

SketchUp can display accurate shadows, one of its most useful features. To do this, three pieces of information are necessary:

- The time of day
- The day of the year
- The latitude of the building site

TECHNICAL STUFF The sun's position (and thus the position of shadows) depends on geographic location — that is to say, *latitude*. The shadow cast by a building at 3:00 on March 5 in Minsk is very different from that cast by a similar building, at the same time of day, on the same date in Nairobi.

If you display shadows on a model of a toaster oven, geographic location probably doesn't matter to you; the shadows are just there for effect. But if you try to see how much time your pool deck will spend in the sun during the summer months, you need to tell SketchUp where you are.

Telling SketchUp where you are

Do you know the precise latitude of where you live? We sure don't. It's a good thing SketchUp helps you figure out where in the world your model is supposed to be. You can *geo-reference* your model (give it a geographic location) in two ways; which one you choose probably depends on whether you have an Internet connection:

- **Using a geo-location snapshot:** This is by far the simplest approach, but it requires that you have a precise idea of where your model is supposed to be on the globe. It also requires that you be connected to the Internet for the operation. If you know exactly where your model is supposed to go, and you're online, use this method. Take a look at Chapter 8 for a complete set of instructions.
- **Using the Model Info dialog box:** This method is a little more complicated, but it's your only option if you're not online. Read on for all the gory details.

To give your model a geographic location when you're offline, follow these steps illustrated in Figure 10-17:

1. **Choose Window ⇒ Model Info.**
2. **In the Model Info dialog box that appears, select Geo-Location in the sidebar on the left.**

   TIP If you see anything other than `This model is not geo-located`, stop here. Your model has already been geographically located, and you don't need to go through any of the following steps. Close the Model Info dialog box, make yourself some coffee, and waste the time you just saved avoiding the next steps.
3. **Click the Set Manual Location button to open another dialog box.**
4. **Enter the required information and click OK.**

   What you type in the Country and Location fields is entirely up to you; it doesn't affect your

model's geo-location one bit. The Latitude and Longitude fields are the important parts of this dialog box.

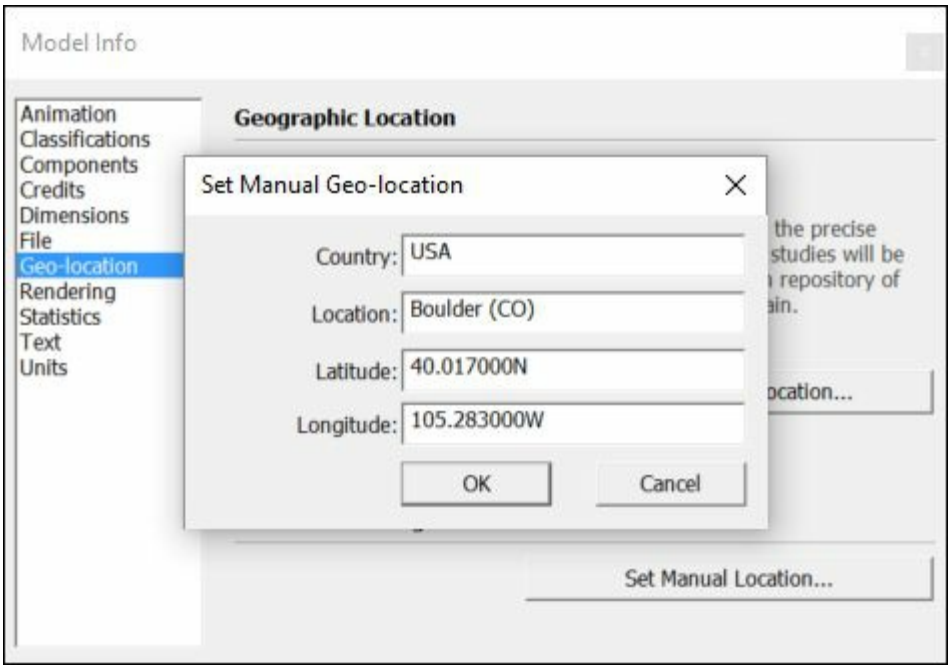

FIGURE 10-17: Giving your model a geographic location when you're not online.

Whether you imported a geo-location snapshot or entered a set of coordinates manually, the next step is to make sure your model is rotated correctly relative to north. If your model faces the wrong way, your shadow studies are completely inaccurate.

REMEMBER All you really need to know is this: By default, the green axis runs north-south, with the solid part pointing north. If north-for-your-building doesn't line up with the green axis, just select everything and use the Rotate tool to spin the building into place. See Chapter 3 for details about rotating a model.

The following method, illustrated in Figure 10-18, works well:

1. **On the ground somewhere, draw an edge that points to where north *should* be.**
2. **Starting at the southern endpoint of the edge you just drew, draw another edge that's parallel to the green axis.**

   You have a V shape.
3. **Select everything in your model *except* the edge you drew in Step 2.**

   Your geo-location snapshot (if you have one) should have a red border around it; that's because it's locked. If for some reason it isn't, context-click it and choose Lock — you don't want to

rotate it accidentally.

4. **Activate the Rotate tool.**
5. **Click the *vertex* (pointy end) of the V to establish your center of rotation.**
6. **Click the north end of the edge you drew in Step 1.**
7. **Click the north end of the edge you drew in Step 2.**
   Now everything's lined up properly.

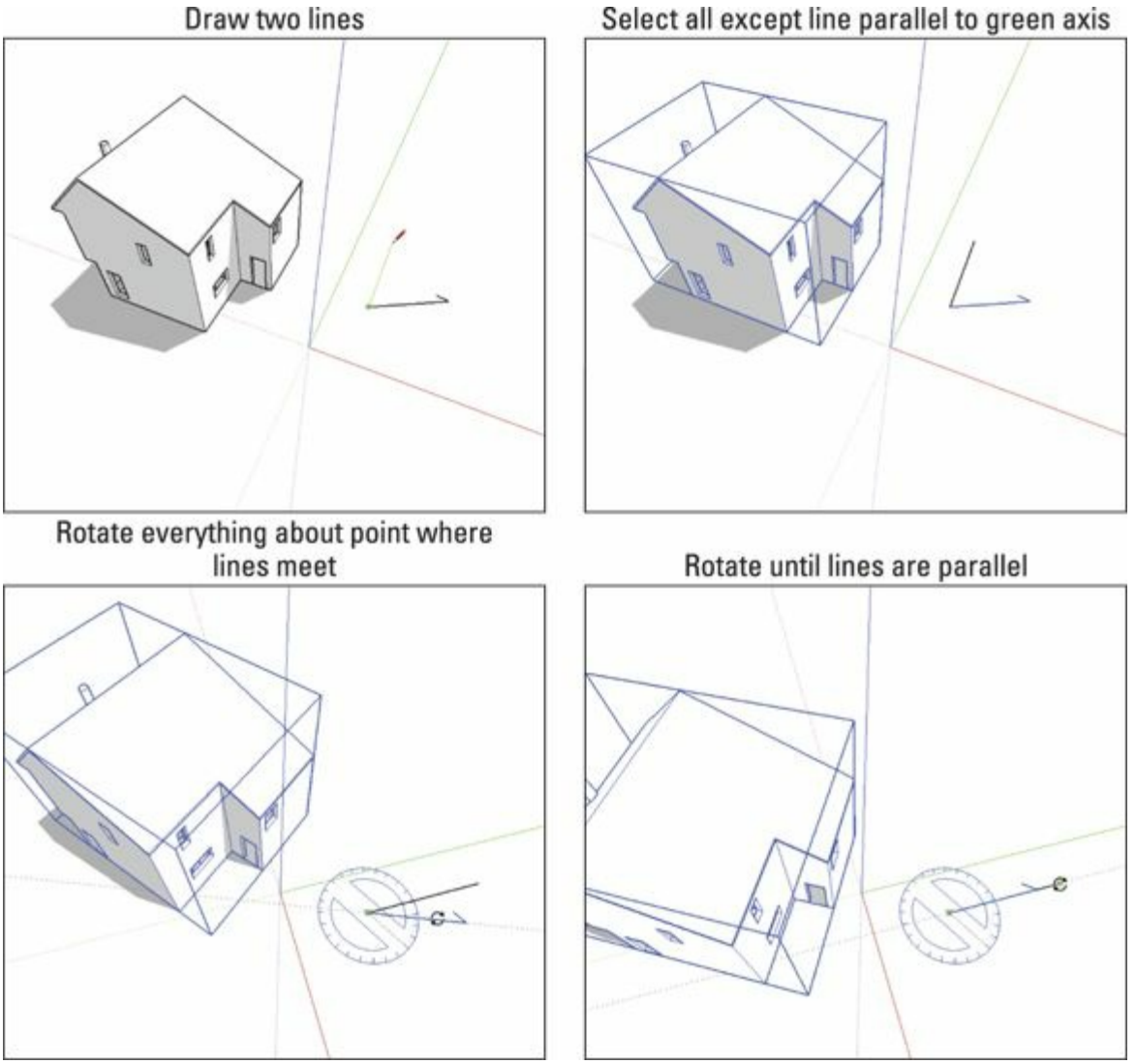

FIGURE 10-18: Make sure your model is correctly oriented relative to north.

Displaying accurate shadows for a given time and place

Now that you've told SketchUp where your model is, it's a pretty simple process to study how the sun will affect your project, as shown in Figure 10-19. This is the fun part; all you have to do is move some

sliders. If you have an audience, get ready for completely undeserved praise.

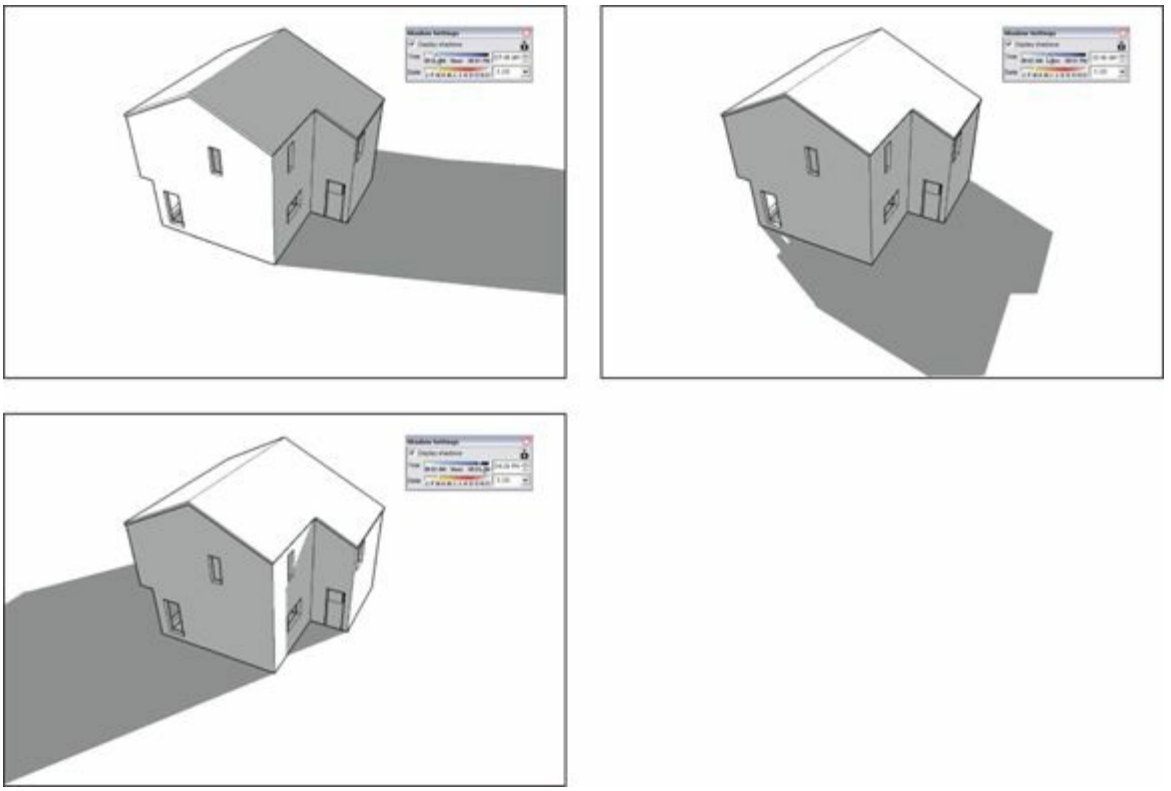

FIGURE 10-19: Studying the effect of the sun on your model.

To study how the sun affects your project, follow these steps:

1. **Orbit, zoom, and pan around until you have a good view of the part of your project you want to study.**
2. **Open the Shadows panel by clicking its right-pointing arrow in the Default Tray (Windows) or by choosing Window ⇒ Shadows (Mac).**
3. **Select the Show/Hide Shadows button to turn on SketchUp's sun.**
4. **Make sure the time zone setting is correct for your location.**

   SketchUp doesn't always get the time zone right for every location in the world; time zones don't always map directly to coordinates. If the time zone you see in the Time Zone drop-down list (at the top of the Shadows panel) isn't correct, choose another one.

TIP Wondering what your time zone is in UTC? Try searching Google for *UTC time zones* to find a list that you can reference.

5. **Type a month and day into the box to the right of the Date slider and then press Enter.**
6. **Move the Time slider back and forth to see how the shadows will move over the course of that day.**
7. **Pick a time of day using the Time controls.**
8. **Move the Date slider back and forth to see how the sun will affect your project at that time of day over the course of the year.**