When opening a new textbook, it's often tempting to skip the introduction and get straight to the meat of the book. But this preface tells you a few items that you need to know before getting started. Skipping this preface may cause frustration later!

Why SketchUp®?

For interior decorators and designers, SketchUp is a near-perfect software application. Intuitive and easy to learn, SketchUp has a relatively small set of tools compared to other CAD programs. But don't let SketchUp's simple appearance fool you. It's an incredibly powerful application, and this book will show you tools that you might not have expected to be available in a free application.

Created in 2000 as a conceptual 3D modeling program with a low learning curve, SketchUp traditionally has been a program used by architects and engineers. Google acquired SketchUp in 2006 and released a free version, expanding SketchUp's user base to include landscape architects, mechanical designers, film and stage producers, woodworkers, product designers, artists, mathematicians, and, of course, interior designers. (There is a professional version of SketchUp priced at about $500, but you won't need the Pro version for anything in this book.) In 2012, SketchUp was acquired by Trimble, an engineering software company. After the sale, there were no significant changes to the software itself, aside from re-branding.

NOTE

At the time of this writing, the sale of SketchUp to Trimble is official; the deal closed in June 2012. But some of the text and pictures that you see in this book may not reflect exactly what appears on your screen: logos and user interface windows may change slightly, URLs may be different, and so forth. The tools and features of the software itself remain unchanged, so the new ownership of SketchUp should not affect the projects presented in this book.

Once you become proficient in SketchUp, you'll be able to design every element in a room; find furniture and accessories in 3D Warehouse; model furniture from scratch; and accurately represent colors, textures, and materials. SketchUp is easily installed on even the most basic laptops, so you can show your ideas, collaborate, and make instant changes while meeting with colleagues and clients. Because SketchUp is free, you can send your models to clients who can view your designs without needing to know anything about the software itself. (For clients who prefer printouts, documents, or graphics instead of an actual 3D model, SketchUp can produce those as well.)

Getting SketchUp

Everything in this book can be done using the free version of SketchUp. There are a few differences between the free and Pro versions, but none of these differences have anything to do with interior design. The current version, at the time of this writing, is SketchUp 8, and no major changes are anticipated in future versions that would affect the book's contents.

Download SketchUp

Figure 1

If you don't have SketchUp yet, go to http://sketchup.com and click the Download SketchUp button (Figure 1).

This will take you to another web page where you'll see a similar download link, as well as a link where you could download the Pro version (which you can ignore unless you have an extra $500). After clicking the download link, just choose your correct platform (PC or Mac), and the rest of the installation should be automatic.

NOTE

If you're curious about SketchUp Pro and its accompanying LayOut application, you can get an 8-hour, fully functioning trial version. When your 8 hours are up, if you don't purchase this version, SketchUp Pro will simply revert back to the free version.

LayOut is a presentation tool through which you can show SketchUp models in standard views, along with notes, callouts, and dimensions. Changes to the SketchUp model can be automatically incorporated into LayOut.

LayOut is a great tool, and it could be a worthwhile investment for you down the road. But you can do a fine job presenting models with the free version of SketchUp, as you'll see throughout this book!

Three-Button Mouse

It's *possible* to use SketchUp with a laptop's track pad instead of using a mouse; however, using a three-button, scrollwheel mouse like those shown in Figure 2 will make the program exponentially easier to use. A three-button mouse enables you to navigate around your model quickly and effortlessly, and you'll never have to click toolbar buttons for the **Zoom** and **Orbit** tools. (Take it from co-author Annie Elliott, who spent 2 years using SketchUp with a track pad, until Bonnie Roskes convinced her to try a three-button mouse. The mouse changed Annie's entire attitude toward modeling: She couldn't believe how much easier it was.)

The scrollwheel has two functions: You can roll it up and down, and you can click it like a button. Rolling the wheel zooms in and out, making objects

Figure 2

appear larger or smaller. Clicking and holding the wheel while moving the mouse orbits around the view; think of holding an object in your hand and turning your hand to see all sides of the object.

Keep in mind that while using the mouse to zoom and orbit, the location of your cursor on the screen affects what happens to the view. For example, if the cursor is at the bottom of the screen and you scroll down, the view will zoom out while moving down toward the cursor.

If you're a Mac user, the single-button Apple Mouse (formerly known as Mighty Mouse) works well, but the newer Magic Mouse gets less-than-glowing reviews. Keep in mind that any three-button mouse can be used with a Mac; it doesn't need to be an Apple product.

> **NOTE**
>
> If you're a Mac user stuck with a mouse that's not ideal, you can use keyboard shortcuts instead. Pressing and holding the Control and Command keys simultaneously while clicking and holding the left mouse button will activate the **Orbit** tool.

For PC and Mac users: If any of your mouse buttons don't produce the expected function in SketchUp, check your mouse settings. On a PC, you can find these settings under **Control Panel**, and on a Mac, they are found under **System Preferences/Keyboard and Mouse**. The left button should be set to "click," the right button to "right-click," and the wheel button should be "middle click." Your options might appear differently, depending on your mouse drivers, so you may have to experiment with different settings.

User Interface

Before starting to play with the SketchUp tools, take a few minutes to explore a few features of the user interface.

Templates

When you first open SketchUp, you'll see the **Welcome to SketchUp** window. (If you don't see this window, and SketchUp opens immediately, choose **Help/Welcome to SketchUp** from the main menu.) The window shown in Figure 3 is what you'll see if you're using the Pro version; it's slightly different for the Free version. You can explore the various links for tutorials and help, and when you're ready to start, click the **Choose Template** button.

The available templates are established for different types of models: architectural, engineering, product design, and so forth. Different templates also use different units, such as centimeters or feet and inches. Choose any one of the templates and click the **Start using SketchUp** button at the bottom of the window (Figure 4).

The empty file that opens looks like the template swatch that you selected. You may have a blue sky and green ground, you may see a person standing in the middle of the model, or you may just have a white background and nothing else.

Toolbars and Shortcuts

The **Getting Started** toolbar is the horizontal toolbar along the top of the SketchUp window (Figure 5). Most of the tools that you'll use in SketchUp can be found here.

If this looks like a sparse assortment of tools, don't worry because there are many more toolbars available. If you're using a PC, look at the **View/Toolbars** menu to see the toolbars listed, and toggle them on and off if you're curious about what they contain. On a Mac, choose **View/Customize**
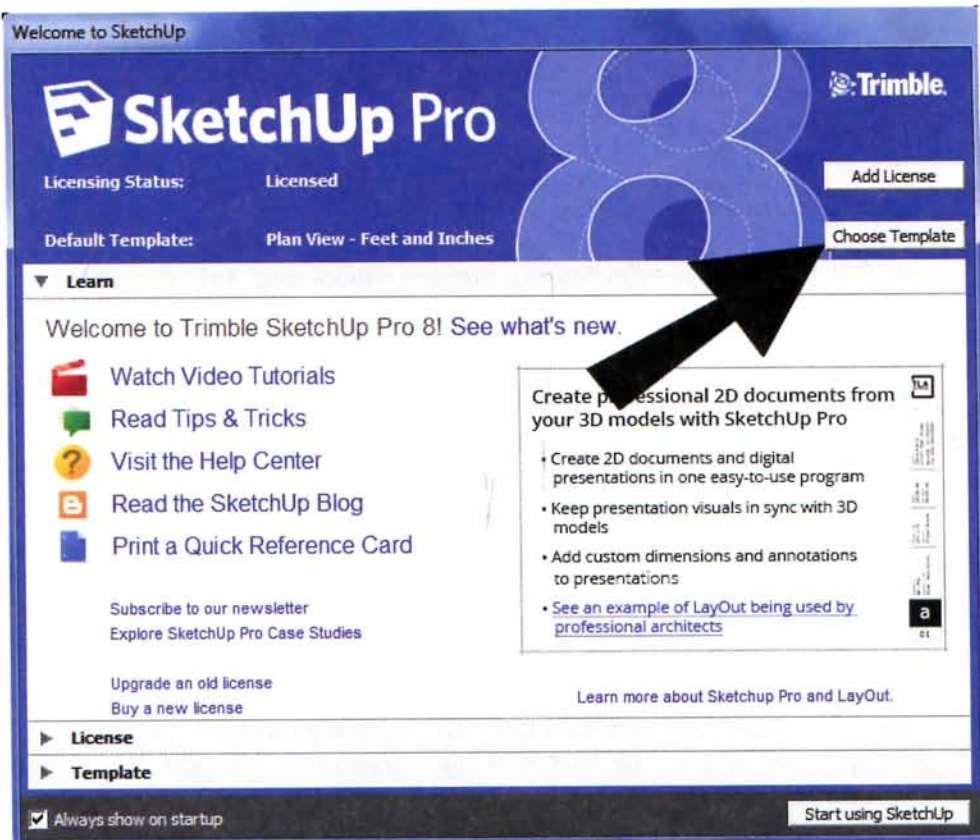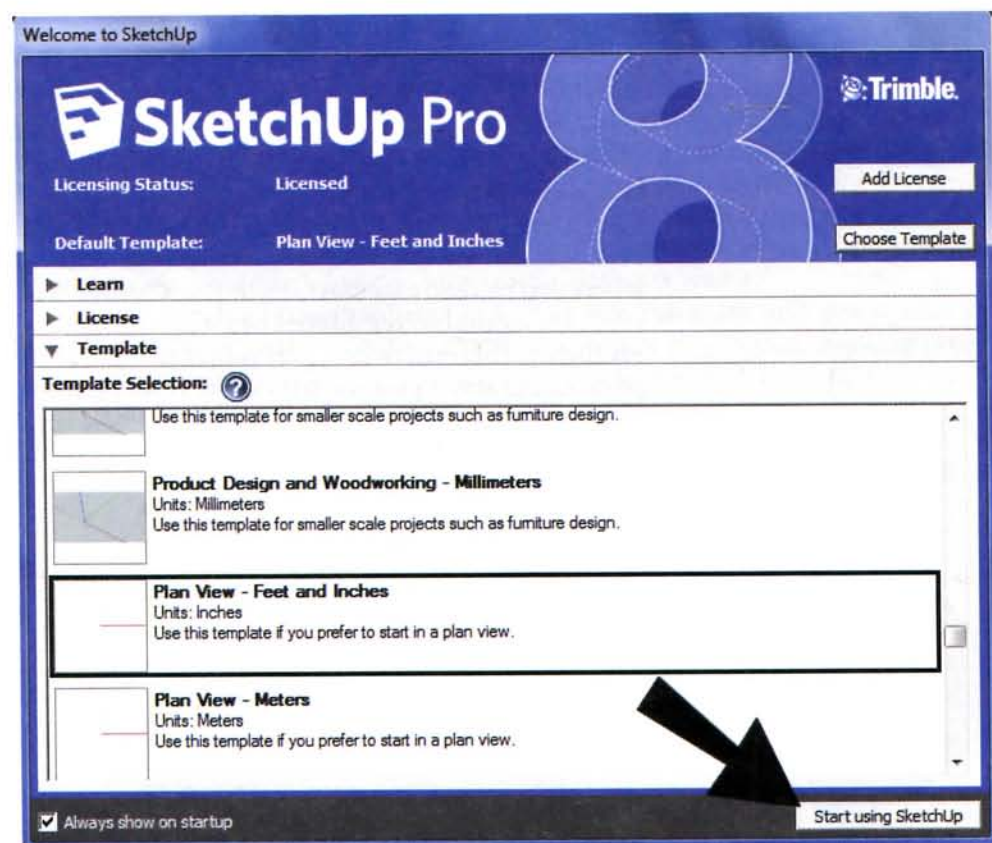
Figure 3

Figure 4

Toolbar. From the large window that appears, you can drag any toolbar onto the main toolbar. You can also drag them off of the main toolbar in the same manner.

Using keyboard shortcuts can be a great time-saver. For example, if you need to draw a line, it's a lot quicker to press the *L* key than to move your mouse over to the **Line** icon. You can look at the SketchUp menus to see what shortcut keys are already defined, such as *L* for **Line**, *R* for **Rectangle**, and so forth (Figure 6).
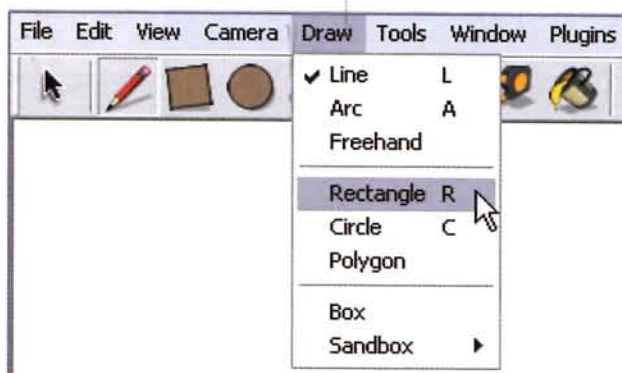
Figure 6

Changing or adding shortcuts can be done on the **Shortcuts** page of the **Preferences**, which is a user interface window that will be described later.

Model Info

The settings on the pages of the **Model Info** window affect the current model only (as opposed to settings that affect all SketchUp models, which are set in the **System Preferences**). To open this window (Figure 7), choose **Window/Model Info** from the main menu.
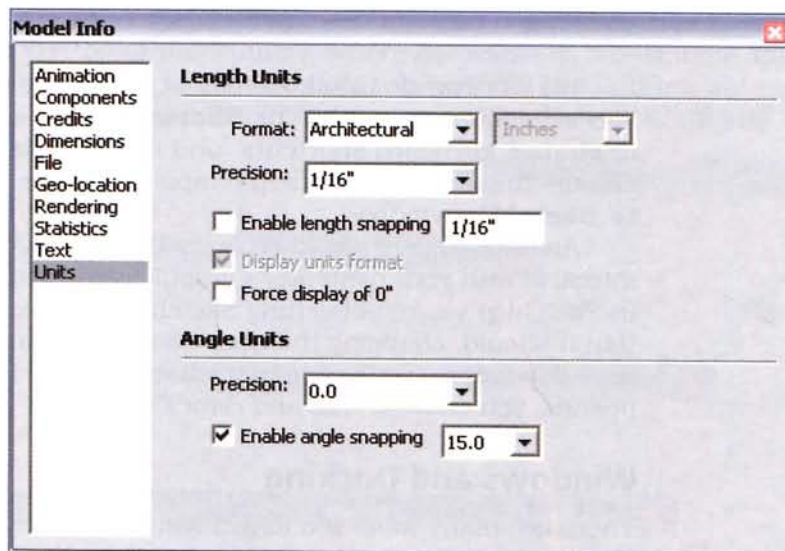

Figure 7

Take a few minutes to look at the options on the various pages. You won't need to change most of these options, and almost everything on this window is self-explanatory. For interior designers, the most important **Model Info** page is **Units**, where you can set whether you're working in architectural (feet and inches) or decimal (choose from inches, millimeters, centimeters, etc.) units. The other pages that will be used in this book are **Dimensions**, **File**, and **Text**.

System Preferences

As with most computer applications, **System Preferences** contain options that affect the application in general. The options that you set here will be used every time that you open a SketchUp file, at least until you change the options. PC users open this window by choosing **Window/Preferences** from the main menu; Mac users choose **SketchUp/Preferences**. The options for PC users (Figure 8) vary a bit from what Mac users will see.
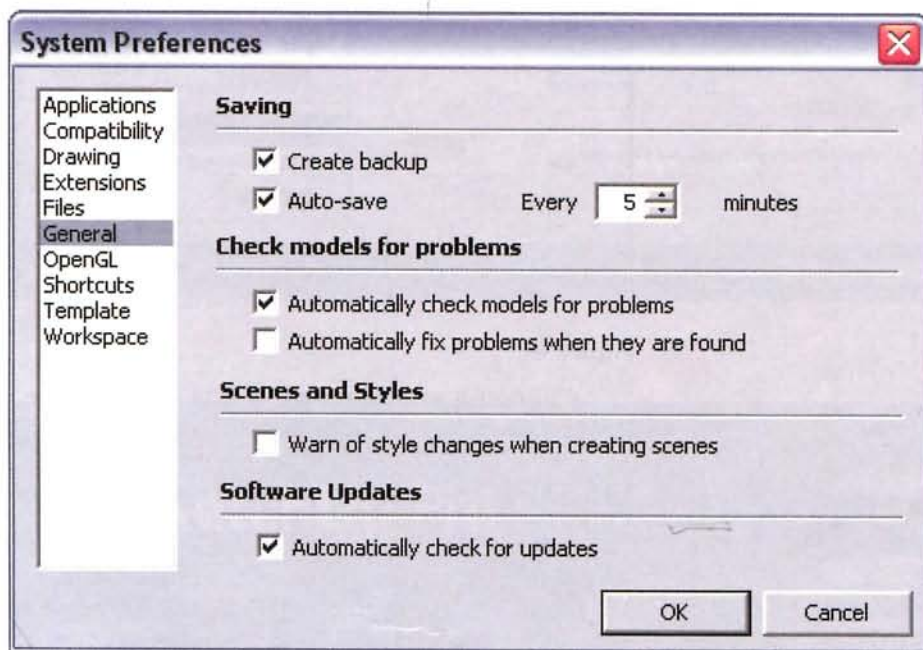
Figure 8

It's worthwhile to take a look at each page on this window, although you won't change much. The **Shortcuts** page enables you to add, remove, or change keyboard shortcuts, and the **Template** page enables you to change the default SketchUp template, just as you could in the **Welcome to SketchUp** window.

Another page to quickly scan is **OpenGL**, which controls how SketchUp interacts with your computer's graphic card. If at any point while working in SketchUp you're not getting SketchUp to select or display objects the way that it should, changing the OpenGL options can help. What each option does depends on your computer's hardware, and because there are only a few options, you can use trial and error to find your perfect settings.

Windows and Docking

There are many more SketchUp windows that you'll be using, such as the **Materials**, **Scenes**, **Components**, and **Layers** windows shown in Figure 9. Any window can be opened by choosing it in the **Window** menu. When several
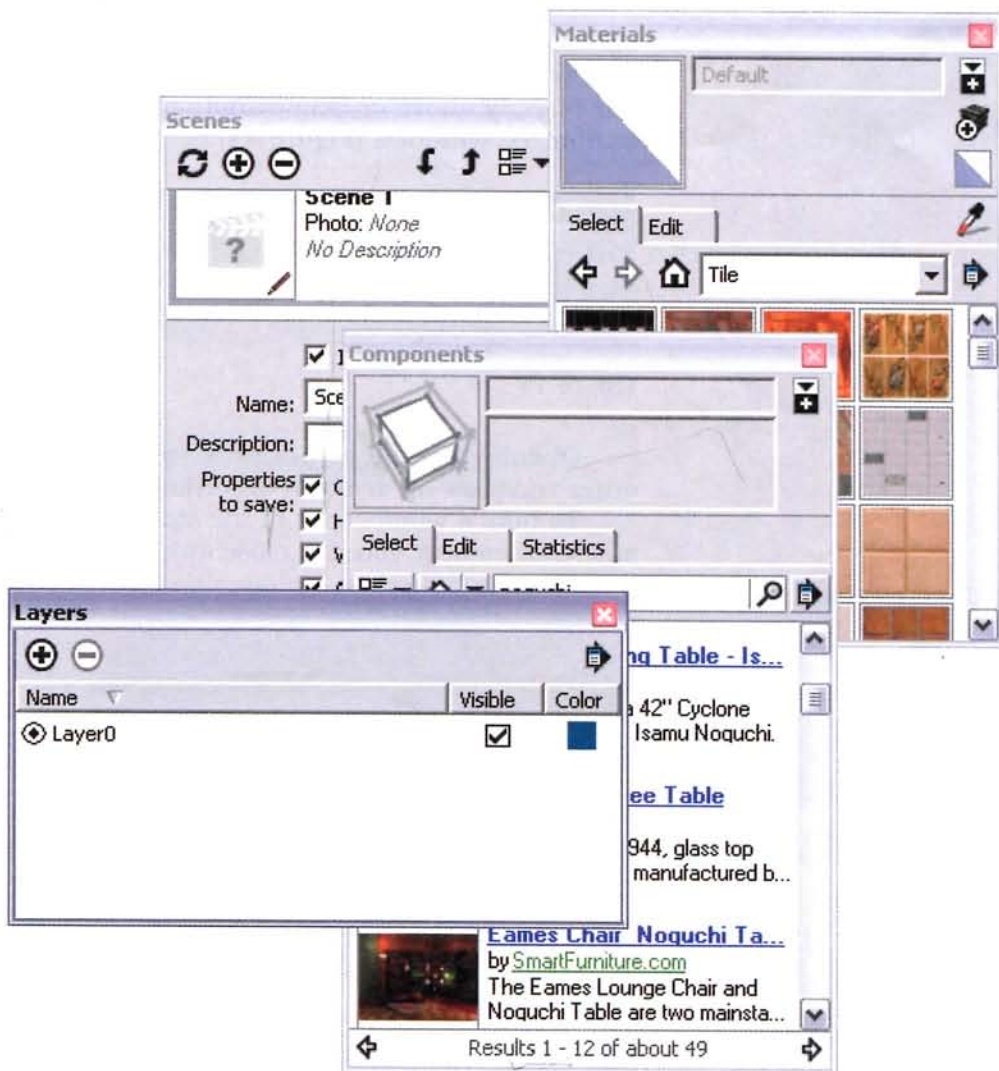
Figure 9

windows are open at once, the screen can get so cluttered that you'll have no room for the model itself.

To save space, you can click on a window's title bar (the bar across the very top of the window, where the name of the window appears). This minimizes each window so that you can still see nothing but its title (Figure 10). To open a minimized window, just click its title bar again.
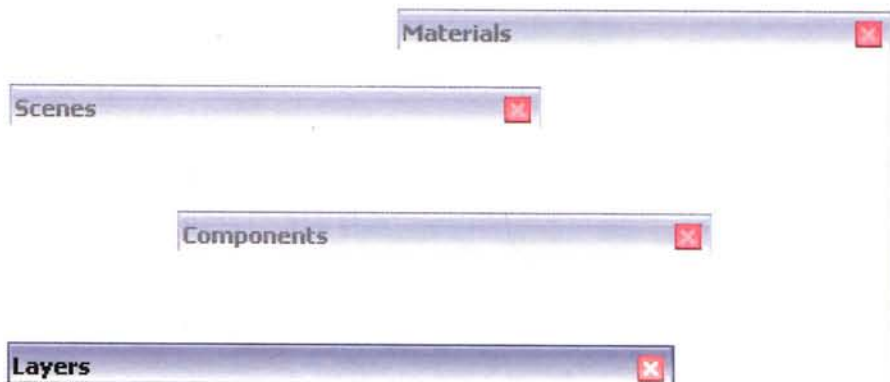

Figure 10

To save even more space, you can *dock* windows (move them to a specific part of the SketchUp window or "glue" them to each other). You can drag a title bar to the left or right edge of the window, or drag a title bar directly above or below another title bar. This way you can stack minimized windows (Figure 11).
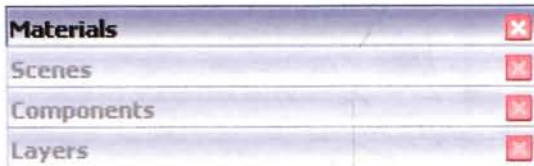

Figure 11

Opening a minimized window while it's stacked will simply move the other windows up or down accordingly (Figure 12).

To take a window out of the stack, simply drag its title bar out of the stack. Of course, you can close any window by clicking the *X* icon in the title bar.

Figure 12

Using the SketchUp Tools

All of SketchUp's tools are easy to use, especially after you've had a bit of practice. But even if you're just starting out, you won't be in the dark about what to do. The **Status Bar** will tell you what steps to take, and the **Measurement Field** is where numbers will appear (if needed), such as length, angle, or radius.

As an example, let's draw a line with a specific length.

1 Click the **Line** tool indicated in Figure 13.

Figure 13

2 Look at the lower left corner of the SketchUp window, where the **Status Bar** tells you "Select start point" (Figure 14).
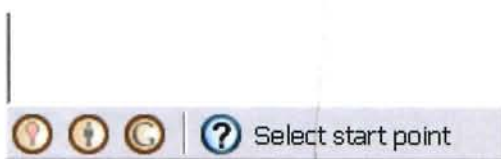

Figure 14

NOTE

To the left of the **Status Bar** are three icons that won't be used in this book. The Lightbulb icon tells you whether the model has a specific location on earth (known in SketchUp as "geo-located"). This is for models that are integrated with Google Earth. The Person icon indicates whether you've taken credit for the model, which is relevant if you're placing a model in 3D Warehouse. The G icon indicates whether you're logged into your Google account. You need a Google account to upload models into 3D Warehouse.

3 Click anywhere to start the line, and move the cursor in the red (horizontal) direction (Figure 15). Don't click again yet.

Figure 15

4 Look at the **Status Bar** for instructions on the next step. You have a choice: Either click a point to end the line, or enter a value (Figure 16). To enter a value, in this case, means to set the line's exact length.
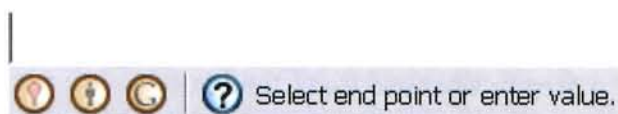

Figure 16

5 While the line is still unfinished and you're moving the cursor in the red direction, look at the **Length** field in the lower right corner (Figure 17). Here you can see the current length of the line. (The units in this field are the ones set on the **Units** page of the **Model Info** window.)
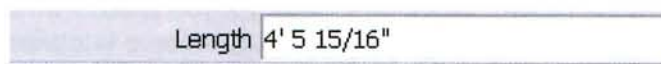
Length 4' 5 15/16"

Figure 17

This is the **Measurement Field**, and its contents and title depend on what tool you're using. For example, if you're creating a rectangle, you can enter two values: width and height. If you're creating a circle, you can enter a radius.

6 You could end the line by clicking a second point, but to set the length of this line, type 12' (the apostrophe is the symbol for feet), and this number appears in the **Length** field (Figure 18). This is an important point: *You never have to click in a measurement field, and if you do click there, your current action will end!* It may feel counterintuitive, but don't click; just type whatever characters you need and they will appear. You'll get used to it!
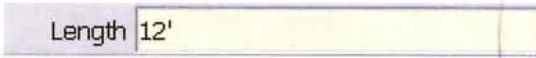
Length	12'

Figure 18

7 Press Enter, and the line is created with the correct length.

You'll see similar **Status Bar** instructions and measurements for other tools. For example, the **Rectangle** tool will tell you first to click the first corner, then either click the second corner or enter width and height values. **Eraser** instructions will tell you to click edges to erase, or that you can drag the cursor to erase multiple edges at once. The instructions also tell you what the modifier keys Shift and Ctrl/Option will do while erasing.

Each time that you click an unfamiliar tool, make sure to check the **Status Bar**; you'll see just what to do and you may learn features of the tool that you didn't know about. Always look to see what's listed in the **Measurement Field**.

Here are some other important items to keep in mind while creating or editing objects in SketchUp:

- **Don't click and drag your mouse.** It may be instinctive to draw a line or pull out a face by clicking the first point, dragging to the second point, and releasing the mouse button to finish. But SketchUp provides much more flexibility when you get out of the dragging habit. For every tool in which multiple clicks are required, click and release the mouse button, move the mouse to the next point, and click/release again.

- **Undo is your friend.** If you click somewhere that you shouldn't have, or make any sort of error, you can undo your steps, one by one, all the way back to the very start of your model if necessary. On a PC, **Undo** is Ctrl+Z, and it's Cmd+Z on a Mac. If you undo too far, and want to redo a step or two, use Ctrl/Cmd+Y.

- **Bail out with the Esc key.** If in the process of using a tool, you've made a mistake but haven't completed the operation yet, press Esc to start over. For example, if you click to start a line in the wrong place, just press Esc and click the correct spot.

- **Click actual points.** Far too often, SketchUp users click somewhere that's "close enough" when there's an actual point that can be clicked. For example, if you want to move a sofa to the edge of a floor, click somewhere along the back edge of the sofa; don't just click somewhere *near* the back of the sofa. As you'll see throughout this book, SketchUp helpfully tells you when your cursor is on an endpoint, center point, or midpoint; on a face; or on an edge. Take advantage of these indicators because it's a lot better than estimating points by sight!

- **Right-click in blank space to unselect everything.** Many SketchUp operations start by selecting the object on which the tool will perform an action. After the action, the objects usually remain selected. If you leave objects selected and then try to work on other objects, you might end up with strange results! A quick right-click in empty space will unselect everything in the entire model.

- **Don't click in the Measurement Field!** This was stated earlier, but it bears repeating because people do it far too often. You might *want* to click in the spot where the line's length appears, but keep your mouse away! All you have to do is type, and whatever you type will appear.

3D Warehouse

The 3D Warehouse is part of what makes SketchUp such an incredible tool for interior designers. Maintained by SketchUp and hosted by Google, 3D Warehouse is a repository for any kind of model you could possibly imagine. So after you model a room, you can find objects in 3D Warehouse to furnish the room.

Because *anyone* can upload SketchUp models into this repository, amateurs and professional designers have added thousands of models to 3D Warehouse since it was established in 2006. In addition, dozens of furniture and appliance manufacturers have uploaded models of their products, free for all to use.

Sometimes you'll find a 3D Warehouse model that's *almost* what you're looking for, but it's not perfect. This book will teach you how to modify those 3D Warehouse models to meet your exact needs. (Two chapters in this book also show how to model furniture from scratch.)

To get a quick idea about how 3D Warehouse works, open this URL in your Internet browser: http://sketchup.google.com/3dwarehouse

> **NOTE**
>
> If this URL changes in the future, a simple web search for "3D Warehouse" will take you to the correct website.

In the search field, enter a search term for the model in which you are interested (lounge chair, base cabinet, window blinds, Porsche, chainsaw, etc.), and you'll find several models (sometimes hundreds) that match your term. As with a regular Google web search, models are listed in order of popularity. Some models have ratings and reviews, some building models are geo-located (they have a specific location in Google Earth), and some are beautifully created by design professionals, while others are created by SketchUp enthusiasts with varying degrees of quality.

> **NOTE**
>
> Later in this book, we'll see how to access 3D Warehouse from within SketchUp as well, which enables you to import a model directly into the SketchUp file on which you are working.

Because of the ever-increasing number of uploaded 3D Warehouse models, a general search for a term (such as "base cabinet" or "sofa") will result in a huge number of models for you to comb through. There is an Advanced Search tool that you can use to narrow down your search

by criteria such as minimum rating, author, or Google Earth location. For most of the models used in this book, you'll be told the author (who uploaded the model), and you can add the author's name to your search. For example, looking for a striped couch by Bonnie Roskes can be found be entering "striped couch roskes" as the search term.

About the Authors

Putting this book together required the combination of two distinct skills: a creative and practiced eye for room design, and technical expertise in 3D modeling in SketchUp.

Bonnie Roskes is a SketchUp expert and owner of 3DVinci (http://3dvinci.net), providing manuals, self-guided projects, and tutorials on SketchUp and related applications. Her *Google SketchUp Hands-On* series has been lauded by her loyal reader base as a comprehensive, easy-to-follow book on all things SketchUp. She has also written books for younger audiences: the ModelMetricks series for teaching 3D design for ages 8–12, and GeomeTricks books for teaching 2D/3D geometry to K–12 math students. She also wrote *The Google SketchUp Cookbook* in 2007, published by O'Reilly Press. Bonnie often presents at education conferences, leads software training sessions, and blogs at http://3dvinci.blogspot.com. Trained as a structural engineer, all her years of SketchUp expertise haven't made her much of an interior decorator, as co-author Annie Elliott can attest. In fact, for this book, Bonnie put together a few colorful SketchUp models that made Annie wince, before she made Bonnie change them.

Bonnie met Annie in 2004, when a mutual friend recommended Annie (whose firm is Bossy Color) to help design Bonnie's new kitchen. Annie is an interior decorator and design blogger who worked in some of the nation's top museums before turning to interior design. Quoted frequently in publications from *The Washington Post* to *Real Simple* magazine, Annie is considered an expert on color, residential space planning, and telling people what to do in the nicest way possible. Annie definitely is *not* an expert on software. When Bonnie introduced her to SketchUp, Annie was shocked to discover how intuitive it was. Annie now uses SketchUp for kitchen designs, tile layouts, and, of course, furniture plans. It's the only modeling program that she needs. More information about Annie and her work can be found at http://bossycolor.com.

Both Bonnie and Annie live with their wonderful families in Washington, DC.

About the Cover

The front cover image is a rendered view of a SketchUp model created by designer Surya Murali, whose models also feature prominently in several chapters of this book. A rare case of someone who's both technical *and* creative, Surya is a Kuwait-based electrical engineer who does 3D visualization work as a hobby. Her beautiful room models are well known and admired by those who frequent 3D Warehouse. Her interest in room layouts started in childhood, and her first whole-house project came about

while designing a bungalow for her parents in India, which was built almost exactly to her design. Exploring Surya's models is a great way to get an idea of just how powerful SketchUp can be when it's combined with a great sense of style and design.

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Acknowledgments