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## Introduction

The Blender 3D Cookbook consists of the scripts to my Blender 3D tutorials, at <http://www.youtube.com/irakrakow>. Each script has a link to the Youtube video, if you purchased the book as a PDF. Many of you have requested such a book. I called the book a "cookbook" because you can think of the scripts as "recipes" for producing a desired effect in Blender.

I don't assume any particular level of Blender expertise. My videos cover a wide variety of topics, from beginner to advanced. Like a cookbook, you can pick and choose those recipes you are interested in and skip the ones that you either know about or that you're not interested in. I tried to include something for everyone, including topics such as the Blender Game Engine and Python scripting that have only been lightly covered in other tutorials. If you have suggestions for future tutorials, please email me at [ira.krakow@gmail.com](mailto:ira.krakow@gmail.com).

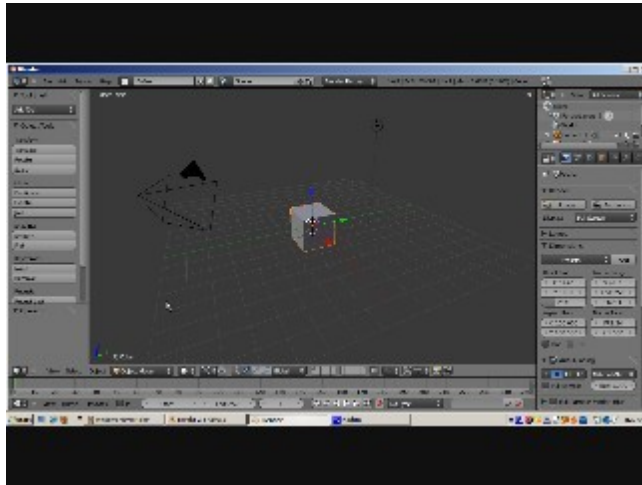
As of this date, Blender is undergoing a massive rewrite and restructuring. The current, production version, 2.49b, will eventually be replaced by version 2.5. 2.5 has a different user interface and has many improvements to old features, as well as many new features. It is currently in alpha, which means that there could be some changes made until the day when 2.5 becomes the production version of Blender. On my Blender 3D forum, at <http://forum.irakrakow.com>, I took a survey of who used what version. I discovered that roughly half worked in Blender 2.4x (although 2.49b is the most current production version, some were working in earlier versions), and the other half worked in Blender 2.5. I have written tutorials based on both versions. For each tutorial, I note which version (2.49 or 2.5) I made it for. Some of the 2.5 tutorials were done in different alpha versions, such as Alpha 0 or even pre Alpha. For the most part, the effects I write about can be produced in any version.

These tutorials are not intended to cover every conceivable Blender feature. That would, in my opinion, be too thick a volume. Note that I suffixed the title to this cookbook "Volume 1". Blender is too complex and rich a program, undergoing constant upgrading and changing, for that. Hopefully, there will be many more volumes of the Blender 3D Cookbook, in the future, that will explore other amazing and unique Blender features.

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# User Interface

## Default Scene (2.5)



Watch the video at: <http://www.youtube.com/watch?v=7cHzs0ga-DY>

This tutorial is a tour of the Blender 2.5 default scene. I would like to give a big Thank You shout out to Neal Hirsig ([nhirsig@tufts.edu](mailto:nhirsig@tufts.edu)), of Tufts University, at <http://www.gryllus.net/>, who created the video on which my video is based.

When you first open Blender a number of default windows, panels, and controls, are displayed. At first you might be intimidated by it, but as you become more familiar with the Blender interface, you'll find that the layout is very well organized and provides an efficient interface for modeling and animation. The default layout contains are 5 Blender windows, called editors. Each of these editors contains a header and a menu line. Sometimes the header is at the top, other times at the bottom. Even though you might think of a header at the bottom as a footer, Blender calls it a header.

The first default editor window is called the Information Editor, located at the very top of the display. This window contains just a header line with frequently used commands in menu form. There is information about the scene, object or subobject elements, memory, and selection.

The second editor window is the Outliner Editor, with a small header window, and a small window at the right, as a hierarchical display.

The third editor window is called the Properties Editor. It's a cluster of context buttons, panels, and controls, which control texturing, rendering, lighting and scene objects. I will move the cursor until I see a double arrow. **5** Left click and drag the window to

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the left to get a better look at it. All Blender windows can be extended this way either horizontally or vertically. The Properties Editor consists of context buttons, similar to tabs, that change panels and controls below depending on the context. Below the context buttons are panels that open and close when you click on the open/close arrows. Inside the panels are controls, which manipulate the scene based on context, These controls are typically either a function, option, or value. I'll resize this window based on the original size.

The fourth editor window is the Timeline editor, at the bottom of the display, which has a header window that contains animation or playback controls, and a running timeline that displays the position of the playback head, with keyframes that you have added to your animation.

The fifth editor window, which comprises most of the default display, is the 3D Viewport editor window. This is where you'll concentrate much of your modeling attention. It consists of a header menu, located at the bottom of the window, that contains viewing and selecting controls. On the far left of the 3D editor window are a number of tool panels for button controls for manipulating selected objects and adding keyframes. On the right is a large viewing space for viewing, selecting, and transforming your 3D objects. This 3D viewing space, which constitutes the visible Blender scene, contains the default cube object, a lamp object, and a camera object. When I select any of the objects by right clicking on them, the various editor windows panels automatically change based on the object being selected.

It's possible to change the type of the editor window. Click on the Editor Type button located on the left end of every editor header menu. For instance, here I will change the 3D editor window the the File Browser editor window.

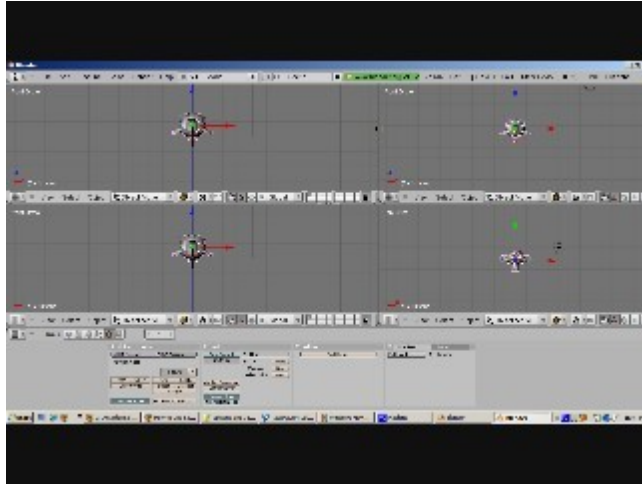
Now I will change it to the User Preferences editor window.

Now I will change it back to the 3D Viewport.

The default Blender window can be changed. I suggest you make only minor changes until you become more familiar with the location of the editor panels, context buttons, and controls available in Blender.

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## Splitting And Joining Windows (2.49)



Watch the Video at: <http://www.youtube.com/watch?v=uYblj8X-ulc>

Blender's default scene has the following three windows:

- The Preferences Window (at the top)
- The 3D Viewport Window (in the middle)
- The Buttons Window (at the bottom)

It is possible to split and join windows, and to turn the window into a different type, so that you get a different view in that window.

To set up the initial scene, Start up Blender. Then, delete the default cube (right click on the cube to select, then press either the DEL key or X, then Enter).

Finally, add Suzanne, Blender's monkey mascot (SPACE - Add - Mesh - Monkey).

Now we're going to split the 3D Viewport window into 4 windows, to show the top, right side, front, and camera views, at the same time. First, we split the window horizontally, as follows:

Drag the cursor to the extreme left edge of the 3D viewport. The cursor changes to a double sided arrow. When you right click, you get a menu with a choice of No Header or Split Area. Click on Split area.

You will see a horizontal line. The line shows where the 3D window will be split if you left click. You can move the line to control exactly where you want the split to occur. When you are satisfied with the split, left click and the window will split horizontally into 2 windows.

We need 4 windows. We will split each window vertically start with the top 3D window, and drag the cursor to the window's bottom edge. The cursor will change to a double sided arrow, this time pointing vertically. When it does, right click, choose Split Area, and you will see a vertical line showing where the window will be split. The line will be in the window that will be split. When you are at the

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place where you want the window to split, left click to split the window.

Do the same procedure with the bottom window, until you get 4 windows.

Each window can be switched to a different type. Blender has many types of windows. If you click on the 3D icon, at the lower left side of the window, you can see all the types. Let's switch to the outline window, which shows all the objects in our scene in a table. As you get more comfortable with Blender, you will switch windows often. The outliner is a handy way to switch between different objects in the scene without having to navigate. It helps when the scene becomes complicated. Our scene has, in addition to Suzanne, a camera and a lamp. Click on the outliner icon and change our view back to 3D.

Right now, each window has the same view of Suzanne, the top view, looking at her from the top down. I just happen to know that. Blender can tell us what view we're in, and it's a good idea that you know as well. To display the view orientation, open up the User Preferences window (it has an I, for Information, label, in the upper left corner. Drag on the bottom of the window until you see a double arrow. Left click and drag down until the window opens up. Press the View Names button, on the left row. The button darkens, which is Blender's way of telling you that the feature is active. Then close the window by clicking on the lower left corner and dragging up.

Note that on each window, on the upper left corner, is the phrase "Top Ortho". This means that the window is in Top View, in what's called Orthographic mode. Orthographic mode means that distance is not taken into account and that the size of the object is not distorted by distance. Most of the time you will model in orthographic mode. We'll discover another mode soon.

Using the View Menu of the 3d window, you can change each view to a different perspective. By using the menu, change the first window to Top, the second window to Front, the third window to Right (the default side), and the fourth window to Camera. Now move the monkey, by right clicking on Suzanne to select it (a pink highlight displays), and then pressing the G key and then dragging the mouse. You can see the effect of moving the monkey in each window.

Look at the window that's in camera view. Note that the indicator in the top right corner of the window is "Camera Persp". Persp stands for Perspective view, which means that distance is taken into account. It's like a highway, where parallel lines meet at a long distance. In orthographic mode, the parallel lines will not meet.

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There are shortcuts on the numeric keypad for switching to each view. They are:

Top View: NUM7  
Front View: NUM1  
Side (Right) View: NUM3  
Camera View: NUM0

Also, by holding the CTRL key at the same time as pressing the numeric keypad, you get the opposite view. Thus:

Bottom View: CTRL+NUM7  
Back View: CTRL+NUM1  
Side (Left) View: CTRL+NUM3

CTRL+NUM0 gives you a message "Object as Camera". This lets you view the scene from the perspective of the object, say from Suzanne, the Blender monkey's view.

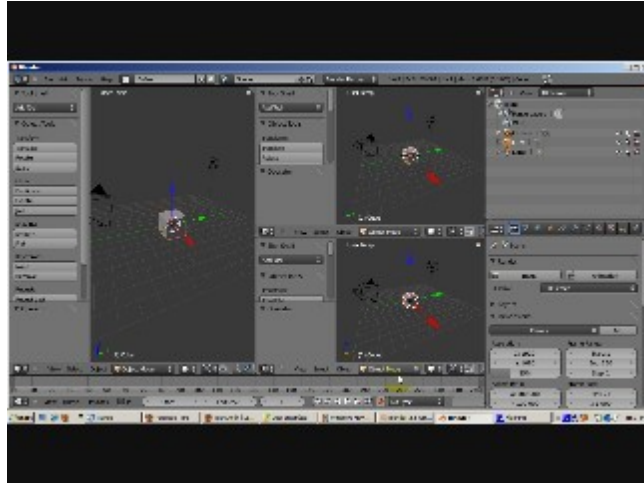
NUM5 toggles between orthographic and perspective, for any view.

To join windows, drag the cursor to the border of the windows to join. When the cursor changes to a double arrow, Right Click and select Join Areas. You'll see a huge arrow, which tells you in what direction the joining will take place. Press Enter to join the windows. You can join either horizontally or vertically.

One last point. If the view is not one of the standard views, say, you rotate your view using the middle mouse button, or ALT+Left mouse button if you have turned on 3D button emulation in your preferences window, Blender calls that view "User", which means you chose your own special, tilted view.

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## Splitting and Joining Windows (2.5)



Watch the Video at: <http://www.youtube.com/watch?v=AMB1R7KB48>

A big thank you to Neal Hirsig ([nhirsig@tufts.edu](mailto:nhirsig@tufts.edu)) of Tufts University. His video, at <http://www.gryllus.net>, was the source of my video. It is possible to expand an editor window by moving the cursor to the edge of the window until you see a double arrow. Left click and drag the window open. This can be done horizontally or vertically.

You also can split an editor editor into multiple editor windows. To split, place the cursor in the upper right hand corner of the editor window. There's a splitter widget that looks like a ridged thumb grip. When the cursor turns into a cross, left click and drag the cursor horizontally to create a vertical split. You can also create a horizontal split by placing the cursor in the splitter widget until a cross appears, and left clicking and dragging the cursor vertically to create a horizontal split. Each window has its own header window and an associated tool panel.

You can click on the Type button at the far left of the window header menu line. Can change this window to a text editor editor.

You can join two vertical windows with the same width, or any two horizontal windows that have the same height. To join, you can move the cursor on one of the splitter widgets, from one window to the other and make it a joined window. Large grey arrow shows the direction of the change. With the left mouse button pressed, you can drag into either of the windows to join to control the direction of the split. Here I will join two vertical windows into one 3D window.

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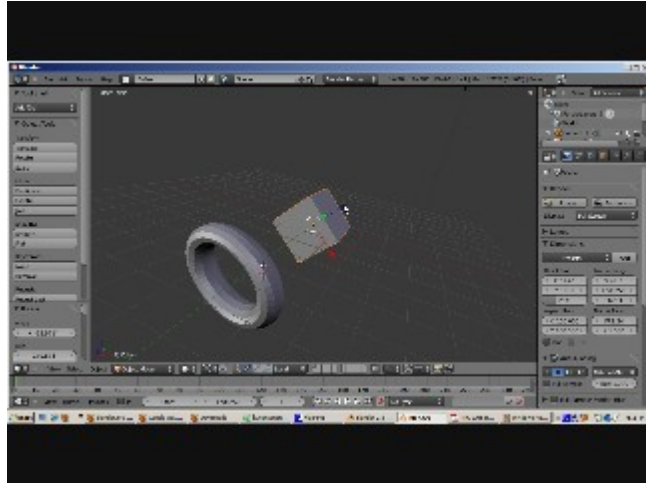
Notice that each panel inside the editor window also contains a thumb grip splitter widget. So you can join and split the windows you just created. In the case of a panel, you can arrange the placement of the panel within the editor window. Place the cursor on the splitter widget in Layers panel and drag to above the Render Panel. Panels cannot be moved from one editor window to another editor window.

You can also make any blender window full screen. To do that, click in the window to give the cursor focus. Then press CTRL+Down Arrow. That makes it full screen. To make it regular screen press CTRL+Down Arrow again. CTRL+Up works as well. It's a toggle. We'll make the 3D Viewport full screen, and then make it regular screen. We'll make the Outliner window full screen and then revert back to regular size. Switching between full screen and regular size windows will make your modeling much more efficient.

The new 2.5 user interface makes it easy for you to control the size and placement of your windows.

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## Orientations (2.5)



Watch the Video at: <http://www.youtube.com/watch?v=eP7G2dC6b4o>

The name of this tutorial is Blender 2.5 Global and Local Orientation. Thank you to Near Hirsig ([nhirsig@tufts.edu](mailto:nhirsig@tufts.edu)). The tutorial on which is this based is at <http://www.gryllus.net>. Blender uses 3 dimensions, X in red, Y in green, and Z in blue. The default orientation is global. The orientation remains constant, regardless of which object is selected or which view is active.

Blender allows you to change the X, Y, and Z axis from global to local orientation.

Start with the default Blender scene. Add a torus (SHIFT+A Mesh Torus). In global orientation, the Z axis runs up and down. The Y axis, in green, runs towards and away from the front. The X axis, in red, always runs horizontal to the front.

Switch to Front view (NUM1). Press R key and rotate the torus Y 45 degrees (R Y 45). You can rotate the torus along the global X or Z axis as well.

You can change the axis orientation from global to local by clicking on the Orientation dropdown box. Change the orientation from global to local. The orientation is based on the object's axis. Can rotate the torus along its X, Y, or Z axis, instead of the global X, Y, or Z axis.

Select the cube. We're still in local orientation. However, since the cube was never rotated, the global and local orientations are the

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same. Rotate the cube 45 degrees on Y axis (R - Y - 45 - ENTER). The Translate manipulator widget reflects the object's axes.

Select the torus. Switch from Translate manipulator widget to the Scale manipulator widget. Scale the torus along local Z axis, or its local X axis.

Switch to the Rotate manipulator widget. You can also rotate the torus along local Z axis and local X axis. Since the rotation is initially around the Z axis and then the X axis, in Front view, we can see all 3 axes, local blue Z axis, local green Y axis, and the local red X axis.

Switch to Translate manipulator widget. Rotate the view to a dimensional user view. With the cube object selected and with the orientation as local, it makes it easier to manipulate objects along its axes. Press SHIFT+D to create a duplicate cube. The duplicate cube moves along the same local axis.

Blender also supports the View orientation, in which the orientation is the same as the view you are in, either Front, Side, Top, or User. A new orientation for 2.5 is the Gimbal orientation which is specific to gyroscopic type objects like a top or a gyroscope.