

6

Modeling Furniture

The next step for our scenes is to add some furniture, to further increase the realism. As furniture is a key element, every item of furniture that we add to the scene increases the level of detail, and the sense of realism. We can classify furniture into two : internal and external furniture.

With the first type, we have all the objects that populate our interior scenes such as sofas, beds, and chairs. The second type refers to items of urban furniture such as cars, fountains, and fences.

This kind of modeling deals with smaller scales, and because of this, sometimes, we have to work at a more detailed level than we are used to. This can cause the modeling process to take a bit longer than usual, but only if we need to create a good level of detail for our models. In this type of modeling, we will use the concept of level of detail again. We discussed this at the beginning of Chapter 5.

As we mentioned in Chapter 5, to use the concept of level of detail effectively, we must begin our projects with good planning. Otherwise, it will be useless to do any kind of optimization without knowing, for example, where the cameras will be.

Another interesting thing about furniture is that we can keep the models that we create to build a good library. With a good 3D models library, we can easily add previously created furniture into new projects, decreasing the time needed to fill up the scene with furniture.

We even can download or buy models on the Internet. The only thing that we will have to do in this case is import the model into our scene.

Create Models or Use a Library?

There are two possibilities when working with furniture. We can create new furniture, or use pre-made models from a library. The question is: when must we use each type? Some people say that using a pre-made model is not very professional thing but what they forget to say is that most projects have a tight deadline, and we need a quick modeling process to be ready on time. So, what's most important for professionals? Getting things done, or telling the client that all the models were created just for his project?

Of course, the deadline is the most important, and your clients normally won't mind if you use pre-made models. Probably they won't even notice. So don't be ashamed to use pre-made models they won't make your projects any less professional. It's even recommended to use these models to speed-up the process, and allow you to spend more time on lighting or texturing.

Is there any situation that demands the creation of a furniture model from scratch? Well, there are some. First, if you can't find the model in any library that you know, then it's going to be necessary to create it from scratch.

If you are working with an architect who designs the spaces and furniture as well, you will probably have to model the furniture too, since it won't be available at any public library. Any project that deals with customized furniture will require that we work on the modeling for the furniture.

Create your own library



A good practice for anyone doing architectural visualization is to collect a lot of 3D models from public libraries for use in future projects. Keep these models for later, but don't forget to check if the author has released the models with no restrictions for commercial use. Otherwise, you must get their permission to use them. If you want to create your library, with no restrictions, why not create your own models? This could be a good exercise: take a few examples, and start creating some furniture. With time, you will have a good number of models.

How to Get Started?

In most cases, we have to get used to all that furniture modeling. We will have to start from scratch, with no blueprints available. The only references that we will have would be the photos, either provided by our clients, or provided from some web resources.

If you have the time, visit a real store, and take some pictures and measures on your own. Sometimes, these stores will give you fliers and brochures, especially if you work with architecture. With time, you will get a lot of good reference material, and some of them come with measurements.

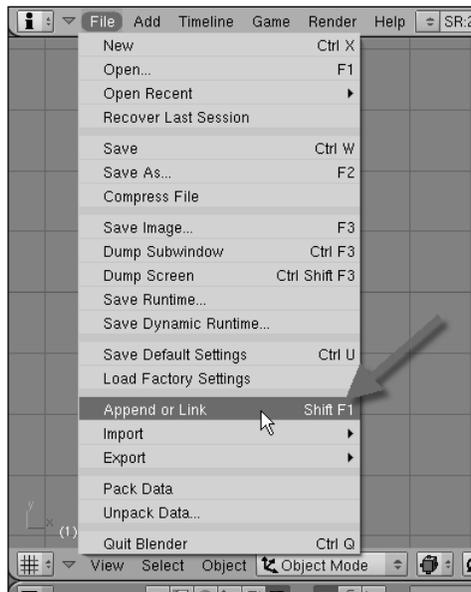
But, if you don't know where to get started, let me point out some great web resources:

- <http://www.e-interiors.net>
- <http://resources.blogoscopia.com>
- <http://blender-archi.tuxfamily.org/Models>
- <http://www.katorlegaz.com/>
- <http://sketchup.google.com/3dwarehouse>

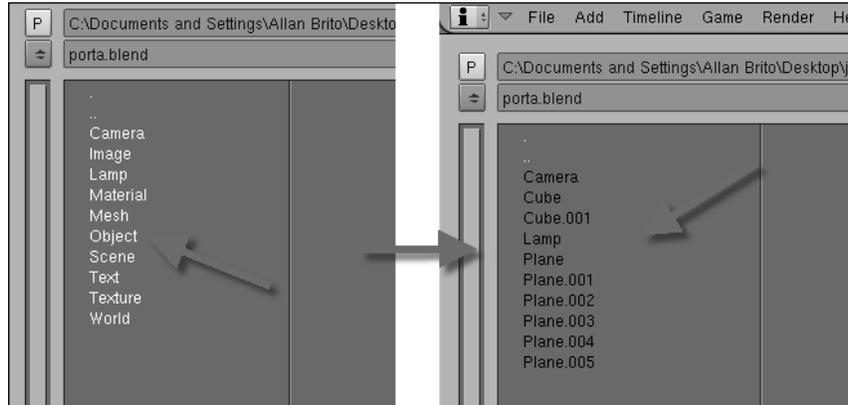
The first link has a lot of reference images classified by furniture type and designer. And sometimes, they even provide free 3D models. Most models there are saved in DXF, or 3DS file formats.

Appending Models

Before we start to model, let's see how we can import a model from an external library into Blender. The process is very simple, and what we have to do is to use the **File** menu, and access the **Append or Link** option. There is a shortcut for that too - just press *SHIFT+F1* to call the same function.



With this option, we have to select file that is already in the **Blender file format**. This option won't import files in other formats. When we select a file, a list of elements available in that particular file will be displayed, for us to select what we want to import. In most cases, the models will be stored under **Object**.



When we click the Object option, all of the objects available in the file will be listed. If you know the name of the object that you want to import, just select the name, and click **Load Library**. The object will be loaded into our scene.

Here, we have two options to handle this object: **Append or Link**:

- **Append:** If we choose this option, the object will be merged into our current scene.
- **Link:** With this option, an external link to the object file will be created. Any modifications to the original file will be reflected in our current scene.

What is the best method to use? It will depend on whether we are willing to track all modifications applied to our furniture models. Using the Link method is a great way of keeping the furniture updated, because every modification at the original file is reflected immediately in the scene in which this model is placed. However, we will have to take the original file with the scene file every time we need to put our scene on another computer. They always have to go together.

But if you choose to use the Append option, things will be a bit simpler, because the object will be incorporated into the scene file. We won't have to be worried about moving the furniture file along with the scene.

Always use the **Append** option when you want to use furniture, or any other model, saved in another Blender file. To use a furniture model saved in another file, with a type other than **“.blend”**, we have to use the Import option.

Importing Models

To import a model, the process is very simple. We must use the **File** menu and select, **Import**. Then we have to select the proper file type from the list. The best file type, and the most common for furniture blocks, is the 3Ds file format, which belongs to the old 3D Studio application. There are some other good formats that work well with Blender, such as OBJ and LWO.



The 3Ds file format can store lights, and it works well with Blender. The only thing we have to take extra care about is that most models imported come with triangular faces, which are a bit harder to edit. But, if you don't need to make any modifications to the model, this won't be a problem.

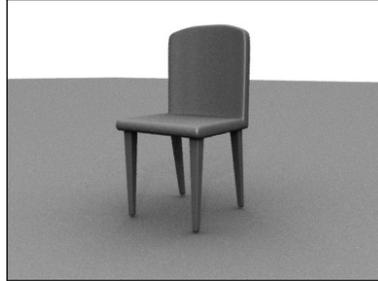
Append or Import?



Just to make things clearer, if you download a furniture model from a web site, and it's saved in the Blender native file format (**.blend**), you should append the model. If you download or get a furniture model on any file format other than **“.blend”**, you will have to import it. Since most models aren't saved in the Blender native file format, we can safely say that almost all furniture models that you find will require an **import** action to be placed in your scenes.

Modeling a Chair

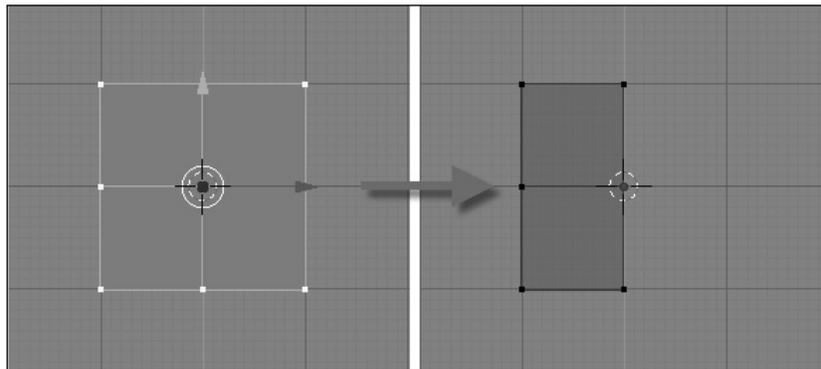
Let's start with something simple, such as a chair. Even for a simple model, it will help us deal with smaller dimensions and details. Here is an image of the model:



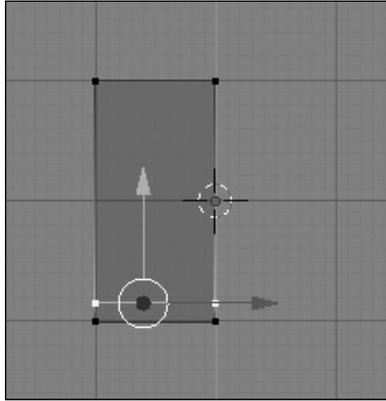
What's the main objective of this modeling? We have to create this chair, with the minimum use of faces and vertices. A good amount of detail can be left for textures, and it's always a good choice to use a lower number of vertices and faces in a model. If you consider one model, it won't matter much. But with a large number of chairs, such as in a theater room, it can make a difference in render time.

Let's get started with a simple cube. Select this cube, and change the **work mode** to **Edit**. Select all vertices and press the *W* key. This will open the **Specials** menu. Choose **subdivide**, just once, from this menu. This will create new vertices and edges. Once these new vertices have been created, as shown in the image to the left, below, press the *A* key to remove all of the objects from the selection.

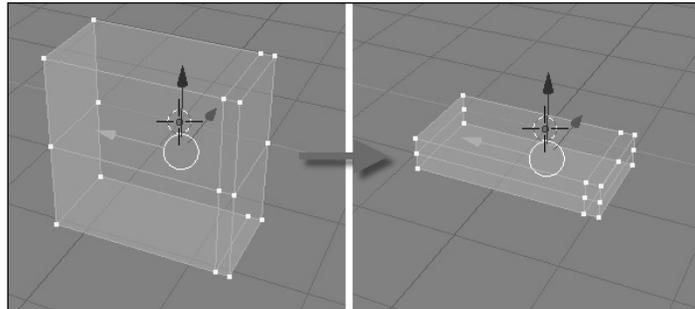
Now, select the vertices to the right, using the *B* key. Remember to change the **view mode** to **Wireframe** before using the *B* key, otherwise, we won't be able to select the vertices behind the visible faces. When these vertices are selected, press the *X* key and choose **Vertices** to erase only the selected vertices.



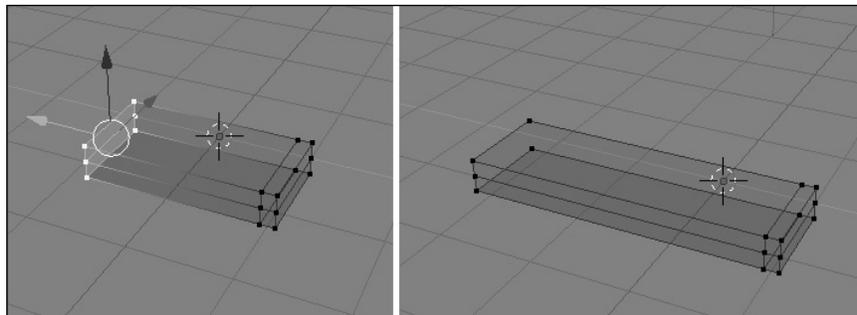
Using the *CTRL+R* key, add a new edge loop to the model, as shown in the following image:



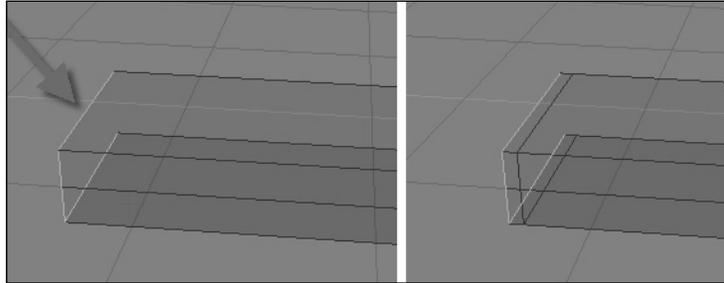
The next step is to change the scale of our model. Rotate the view to see the model in perspective view. Select all objects and press the *S* key, immediately after pressing the *Z* key. This will make the scale work only in the *Z* axis.



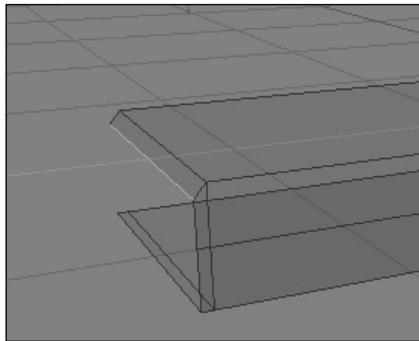
Now, select the vertices identified in the following image and erase them using the *X* key.



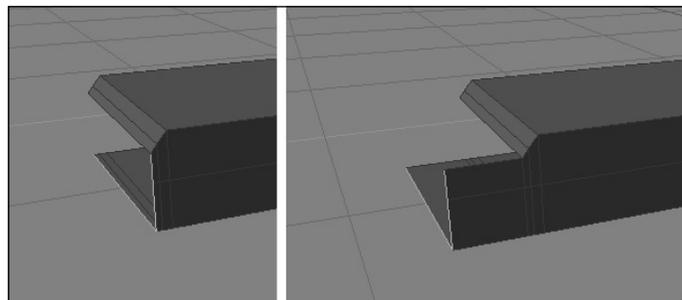
Change the **selection mode to Edges**, and select the edges identified in the following image. With the edges selected, press the *E* key to extrude them.



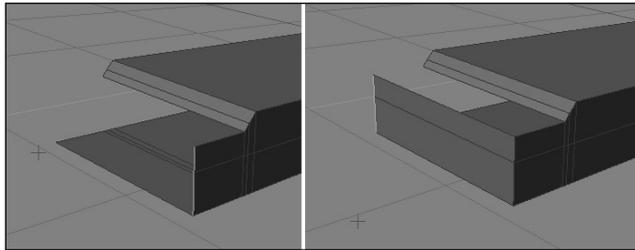
With the new faces created, we can now add some detail to the model. Select only the top edge of the previously created faces. Move this edge down just a bit. This will add a small declivity to the seat.



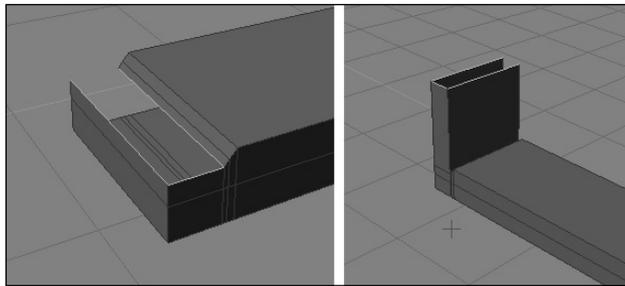
Now, we can move on to the next extrude, which must be from the selected edges identified in the following image. I'm not using any kind of measure for this example, but if you like to work only with real measurements, remember to hold the *CTRL* key every time a new extrude or edge is moved. This way, all transformations will use the grid lines. For this model, I'm not using vertex snap.



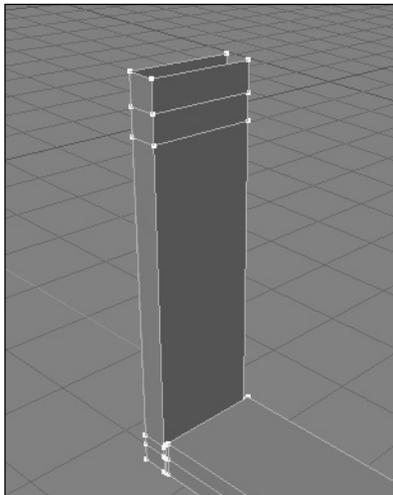
With the new faces created, select just the two edges identified in the following image. Extrude these edges until they reach the other side of the base model. Hold the *CTRL* key, while you extrude them, to help with the precision. If you already want to remove duplicated vertices, select all objects, and press the *W* key. Choose **Remove doubles** to erase any duplicated vertices.



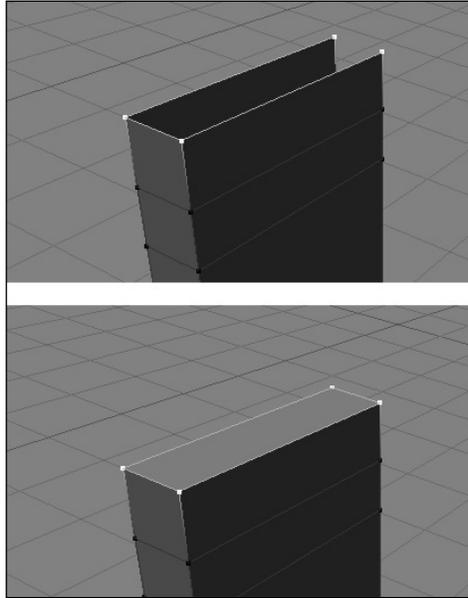
Select the edges identified in the image to keep adding more parts to the chair.



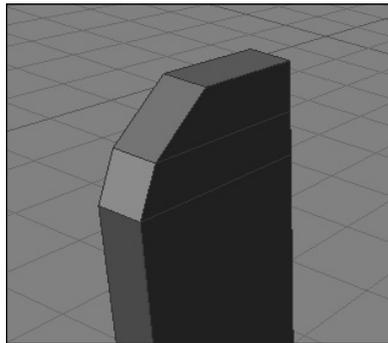
Extrude the edges three times until you have the same structure showed here.



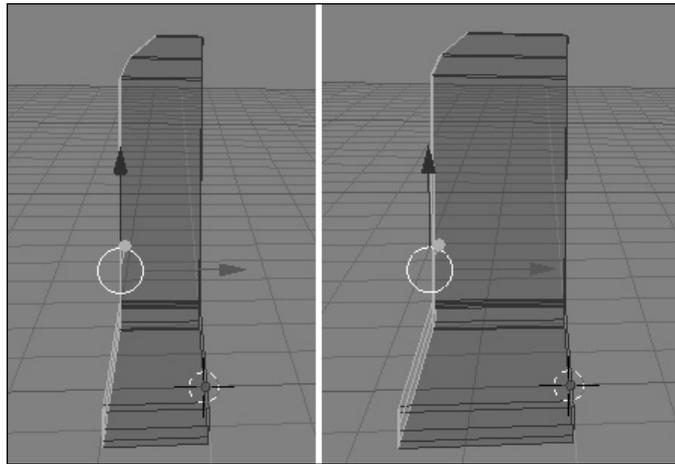
Now, we have to close the top with a face. To do that, we must select all four vertices on the top. When the vertices are selected, press the *F* key to create a new face.



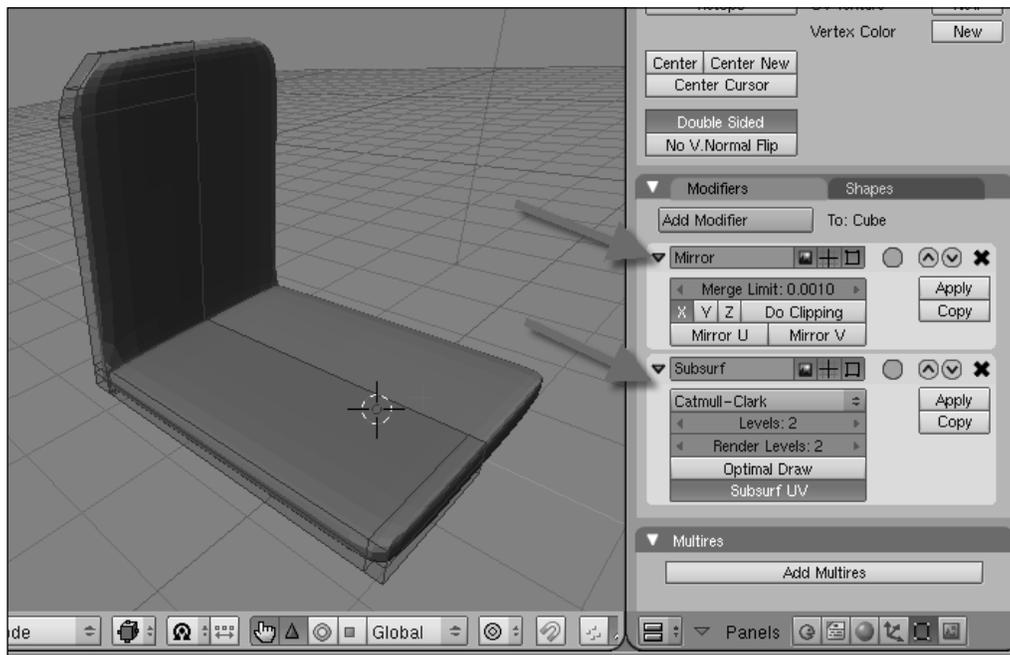
The next step is to select the small side edges to create some detail. Select just one edge, beginning from bottom to top, and move it just a bit. Repeat this operation with the other edges until we get the edges positioned as in the following image.



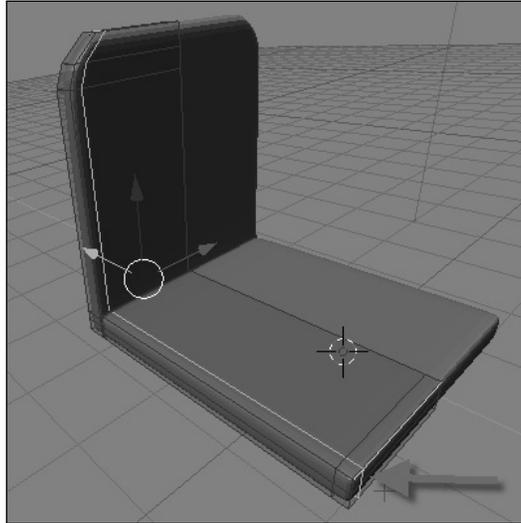
The basic shape of our chair has now been created. Now, we can make some adjustments for improving the overall proportions. Select all edges or vertices on the left side, and move them a bit to the left. This will make the model wider.



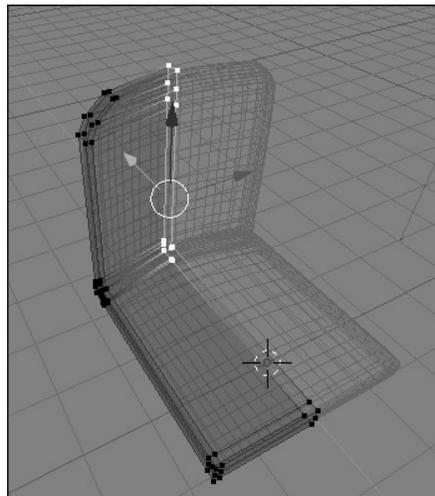
Did you notice that we have modeled only half a chair? Now we can make the other half, using the **Mirror modifier**. Add the modifier, and choose the right axis to make a perfect copy. If the **center point** for the model has been moved, you might need to edit the model to create a perfect mirrored match. Don't worry if you have moved the model by accident - this can happen sometimes. Along with the **Mirror modifier**, add a **Subsurf** modifier, too.



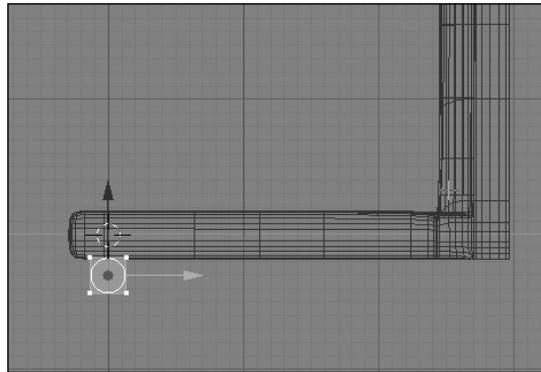
With the **Subsurf modifier**, we realize that this model needs a new edge loop on the left side. Just press *CTRL+R*, and add a new loop, as in the following image.



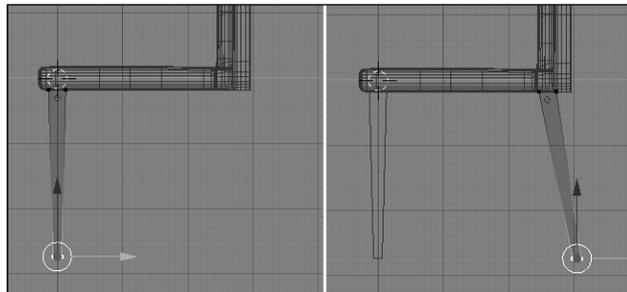
We can make the chair a bit curved at the back of the seat. Just select the vertices identified in the following image. Select them, and move them just a bit to the back. With the **Subsurf modifier**, we will be able to create a curved surface. Along with this curve, we can make some adjustments such as **downsizing** the seat.



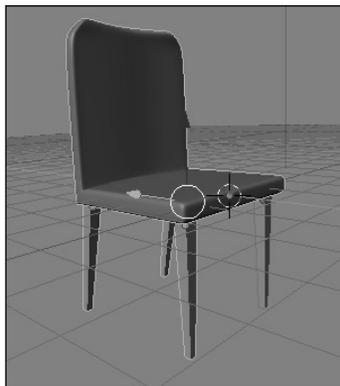
To finalize the model, we must add the support. Just add a cube and size it down until it looks like the following image .



To change your view to one of the side views, just press the **3** key on the numeric keypad. Select the vertices at the bottom of the cube, and move them down. When you place the vertices at the bottom, press the **S** key to scale them down. Create a copy of this cube, and place it at the back of the chair. With this copy, select the bottom vertices and move them to the right.



And now we have a chair model! I know it's simple, but we use the same principles for modeling more complex objects. All we have to do is use the tools wisely.



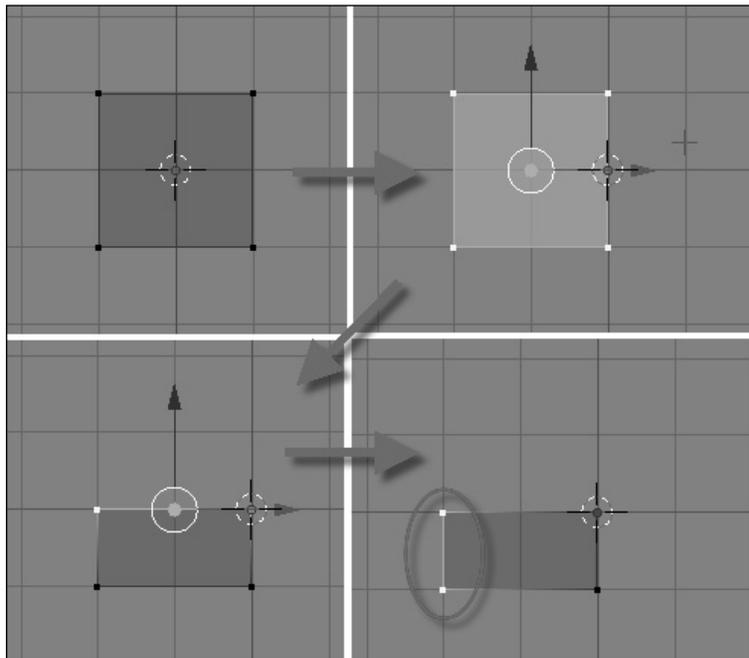
Modeling a Sofa

It is very simple to create certain kinds of models, as we saw in the last example. Almost every object can be modeled from a cube with some extrudes. And with a few adjustments, complex shapes can also be generated. But it only *looks* complex. In our next example, we will create a sofa from three cubes.

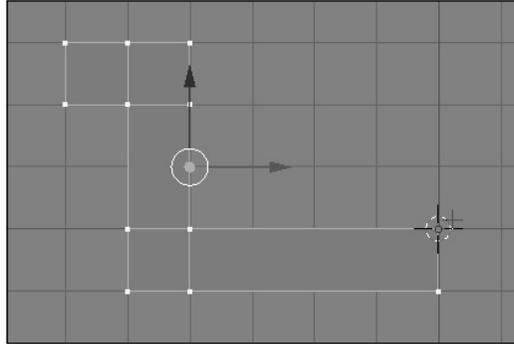
The first step in creating the sofa is to add a cube, if you don't have any objects in the **3D** view. Change your **view** to see the model from the **front view**. After selecting the cube, change the work mode to Edit, and select all the vertices of this cube. In this example, every transformation will be created holding the **CTRL** key down. This way, we will have more control over the proportions of the model.

When all vertices have been selected, move the cube a bit to the left. You can see in the image below that the **3D cursor** is placed to the right of the model. It means that the **object center** is placed there too.

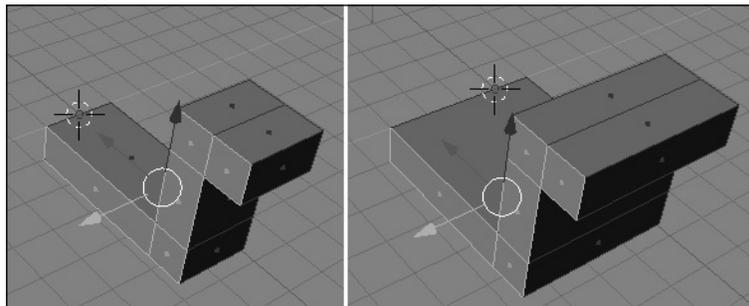
Remove all vertices from the selection. Then select just the top **vertices**, and move them half way down. Hold down the **CTRL** key to make it easier. To finish this part, select only the vertices on the left side.



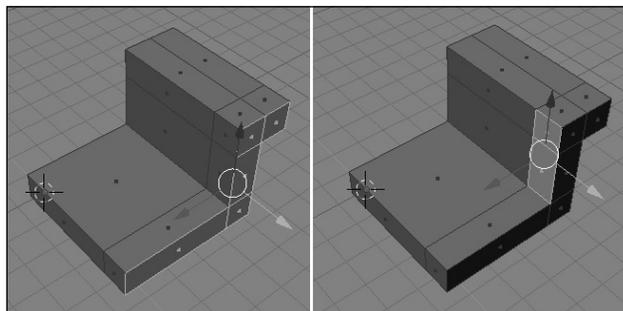
With the extrude tool, we create a structure like the one shown in the following image. The first thing to do is move the vertices a bit to the left, and then extrude the faces by using the *E* key. If you notice, all the new faces and edges are now perfectly aligned with the grid lines. This is because we are using the *CTRL* key.



Now rotate your view, and select the faces on the back of the object. When the faces are selected, just move them to make our model a bit bigger.

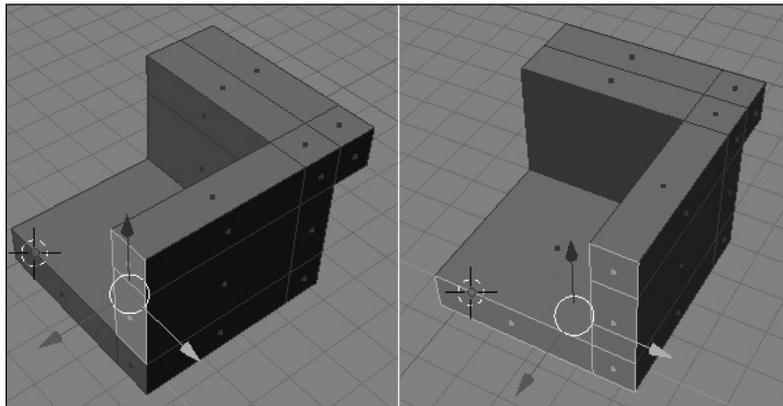


We must now rotate our view, to select the faces identified in the following image. These faces will be extruded.

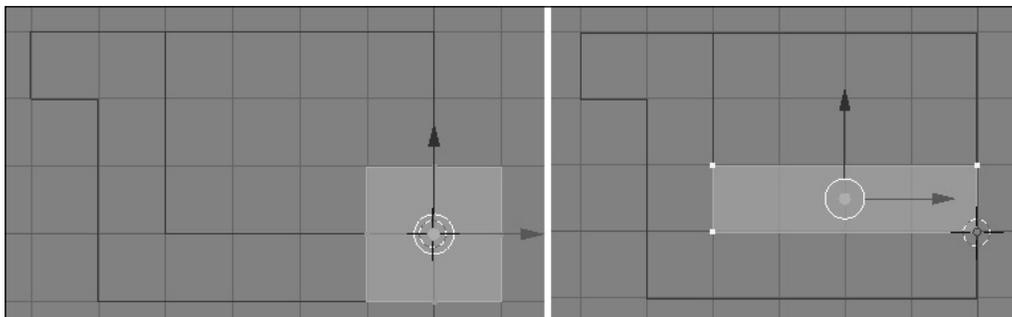


Press the *E* key to extrude the faces, again holding down the *CTRL* key. At the end of this process, select all faces and press the *W* key, and choose **Remove doubles**. We have to remove any duplicated vertices to clean up the model, since we created overlapping faces. But don't worry, with some editing, it won't have much effect on the final model.

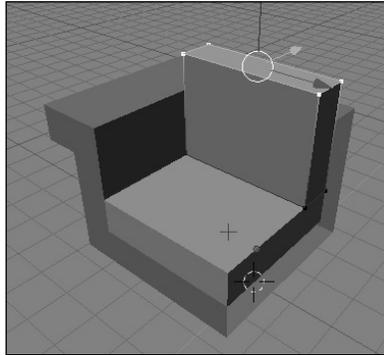
Another thing to do before we go ahead is to select the faces identified in the image in the right. We have to erase the faces, since a **Mirror modifier** will be applied to the model. Once the faces are selected, just press the *X* key and choose **Faces**.



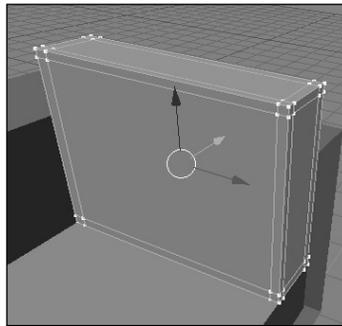
Now that the larger part of the sofa has been created, let's add some more details. Change your **view** to see the model by the **front**. Then, create a cube, and change the size of this cube to fit the place for the seat, as shown in the image on the right, below. You can also change the view to adjust the model from the top, if you prefer.



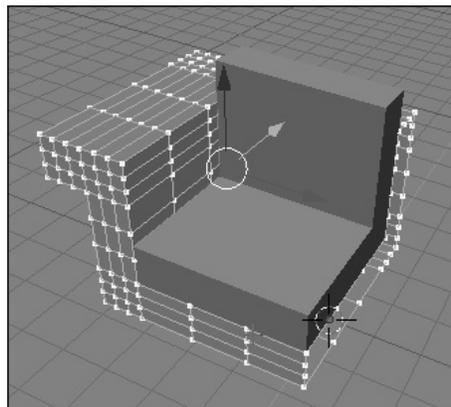
Create a copy of the cube, and adjust its size to make it fit the back seat. A good thing to do here is to add more **edge loops**, using the *CTRL+R* key. This is necessary because we will apply a **Subsurf modifier**.



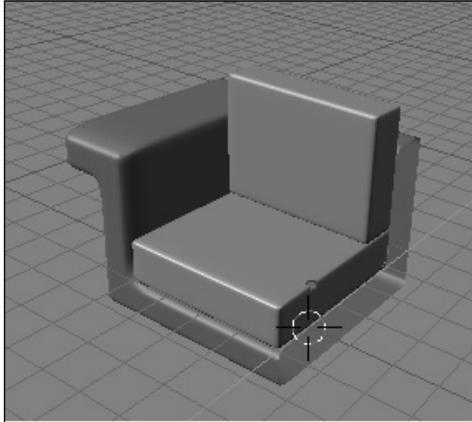
Using the *CTRL+R* key, add six new loops to the cube. Repeat the same process for the other cube. We have to add these new loops close to the existing edges, to control the curvature created by the **Subsurf**, later.



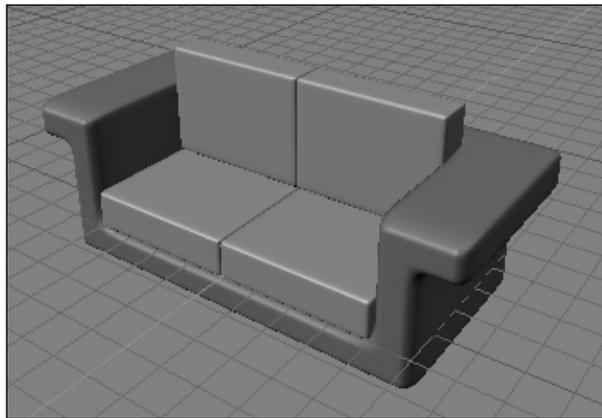
Select all vertices from the larger part of this sofa and press *W*. Choose the **Subdivide Multi** option. As a factor of the **subdivision**, choose 2, and we will have the following image as the result.



To complete this phase, add a **Subsurf modifier** to all objects. Since we've added a lot of new **edges loops**, there won't be any major problems with the resulting object. But if you think there is something that needs to be adjusted, feel free to add more details.



With a **Mirror modifier** added to each object, we will see the final result of this modeling. A simple sofa can become more detailed with a good set of textures or lighting.



Building a library



You don't have to model all the furniture in the scene of a complex model. For instance, for the scene of a dining room, the walls can be modeled in one scene, while the tables and chairs can be modeled in others. To gather all these together in one single scene, we will use the **Append** option. You can follow this simple action: model single objects as individual files, and append them to the main scene. After a few projects, you will have built a significant number of individual furniture files, which will turn into your own furniture library.

Summary

We learned in this chapter how important it is to use furniture in our models and scenes to give the environment more details and realism. Here are some other things that we have learned:

- We can model our furniture and use a pre-made library too.
- Sometimes it is better to use a pre-made model.
- How to build your own furniture library for reuse in future projects.
- How to model a chair.
- How to model a sofa.