

Notes on Blender:

By Matthew Evett

A synopsis of the Wiki:

http://en.wikibooks.org/wiki/Blender_3D:_Noob_to_Pro

The Blender GUI is implemented via OpenGL. Thus the GUI is not “Windows-standard”.

Can resize all 3 primary windows of Blender (user preferences, 3d view, buttons)

3D viewing window:

Middle mouse button (MMB) rotates the view in 3d.

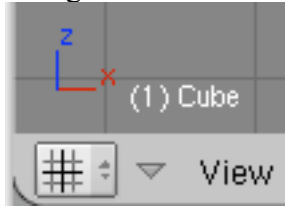
Z toggles wireframe

Num5 toggles orthographic/projection

Camera is shown as a black wireframe frustum. Num0 shows preview.

4 primary objects in view: the object (cube, by default), a lamp (light source), the camera, the 3d cursor.

View movement: num1, num3, num7 switch to pure top, side, and front views. (Note changes to the small image of the primary axes in the l.l. corner of the view window.



) The num2,8,4,6 give incremental rotation around the axes.
Num5 switches between orthographic and perspective viewing.

SHIFT-MMB pans.

Scroll wheel zooms

Placing the 3d cursor. Cursor is always placed in plane parallel to the screen (view).

Consequently, if the xy plane is parallel to the screen, clicking LMB will place change the cursor's xy cords, but not z. Can easily use any 2 of the num1,3,7 keys & 2 clicks to place the cursor at precise xyz cords.

Working with objects:

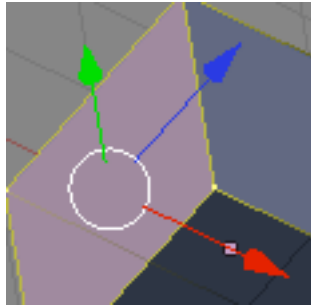
RMB on cube edge will select it. X or del will delete it.

To add object, SPC. Then Mesh -> Monkey to add a monkey. May be easier to see if you switch from wireframe (z key).

Now place cursor in monkey, then use c key to center origin there.

When clicking and dragging with RMB the x,y,z keys can be used to move only along the local or global x y and z axes. Use LMB to finalize location. (Confusingly, the RMB simply toggles out of drag mode.)

Oh, if the 3d view shows a circle with 3 colored arrows emanating from it, this is the 3d



transform manipulator.



For now, toggle it with the button in the header:

Editing an Object:

Having selected an object (RMB) use the TAB key to switch to Edit mode. Vertices show as pink dots when not selected and yellow when they are. Use A to select & deselect all vertices. Use RMB to select individual vertex. The G (grab) causes selected vertex(es) to follow the cursor. Use RMB to cancel. LMB to finalize location.

After playing for a bit, use the Render menu to get a shot from the camera's perspective, with lighting.

Selecting vertices within an object. RMB on each vertex (shift-RMB to add), Or use the B key to enable box-selection. BB will enable circle-selection. CTL-LMB yields lasso selection. The header contains a 4-element palette that supports "face" selection. RMB will then select all vertices defining the selected face.



Extrusion:

Select 4 vertices defining a face then use the E key (extrude). From pop-up menu, select "region". The face will now extrude in direction of cursor. Hold down CTL if you want to "snap" to the grid. LMB will conclude the move.

If, when done, a face is missing, select the appropriate vertices and use F to create a face there. Or, in Mesh menu, use "Make Edge/Face".

Adding new objects:

While in Edit mode, the SPACE will add a new object (from a pop-up menu). This will become part of the current object. (Note that SPACE in Object mode adds a whole new object. It does not alter an existing one.)

The G can then be used to move added (and selected) objects. Hold down the x, y, or z to lock movements to be along those axes.

Surfacing an object:

Make sure you're in Object mode. Then in the lower (Buttons) window, make sure the Editing Panel is displayed (the 5th button should be selected).



In the buttons panel, find and select the modifiers/shapes menu. In Modifier, click on “Add Modifier”, then “Subsurf”. This will subdivide each face into 4 faces, each sloped to better blend with the adjacent faces. The “Levels” button increases from 4 to 16 faces. The “render levels” is similar, but only applies during rendering, not editing.

Don't use the “Apply” button here. That would change the actual underlying model, and we don't want that level of complexity in the model, yet. We leave it to the rendering process.

Next, in the Links/Materials panel is a “smooth”, “solid” button pair. These switch from flat shading to Gouraud shading.

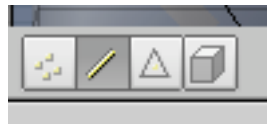
Altering the model:

Select the two edges forming the top of where the legs meet the body. Make sure the 3d



manipulator is now ON.

And the “limit selection to



visible” button is OFF:

Having selected the two edges, we move the 3d simulator tool to be between them.

Then use the “Transform->Snap” menu (SHFT-S) & select “Cursor->selection” to move the 3d cursor to the location of the manipulator. Btw, CTRL-SPACE activates the manipulator menu. From that pop-up menu, can select “Scale”. Now LMB-clicking on the manipulator's axis-arrows alters the selected model components. Again, can hold down the CTL key to snap to grid as scaling occurs.

The relationship between the manipulator object and the selected edges/vertices is important—it controls how movement of the manipulator's axes affects the model. For example, rotation is about the manipulator.

To create a new object, switch to Object mode. Use SPACE to add new mesh (circle). Remove some of the edges. Use selection and G (grab) to manipulate remaining polyline vertices to form cutaway of half of hat shape. Move the cursor to the rightmost vertex of

the hat shape. Then, while in Edit mode, use the “Mesh tools” palette to “Spin” 360 degrees across 12 elements to form the “hat” model.

Now add subsurf to the model to get a smoother hat.

Next, back to Object mode. Use R key to rotate the hat model. Rotation defaults to be around axis normal to the screen and through the “center” of the object. While rotating, the x,y and z keys change rotation to be about those axes. Likewise, S is for scale. G is for grab (translate).

Compositing objects.

Select the hat. Then shift-select the man. Use CTL-P to form a parent relationship—the man becomes the parent of the hat. Now, moving the man will move the hat, but not vice versa.

[I don’t know how to undo a child/parent relationship.]

Textures:

Like GL, Blender supports the idea of *materials*.

Open a canonical cube model. Make sure it is selected and you’re in Object mode. The Material/Ramps palette lets us manipulate the current material for the cube. You should be in object mode, submode shading (F5) and subsubmode “material buttons”.



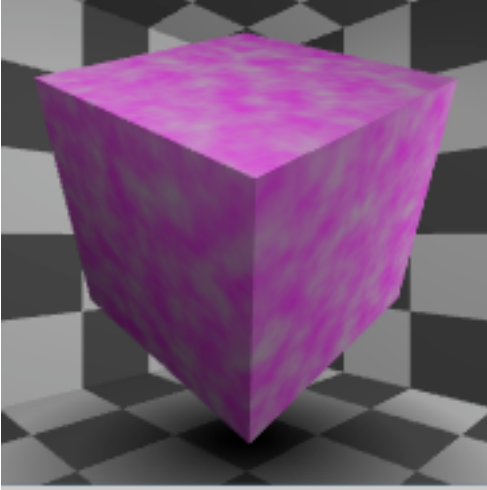
The X button next to MA:Material in the Links and Pipelines panel deletes the object’s link to the default material. Clicking on the up-down menu button left there let’s us reapply the material we just disassociated from the cube. This pop-up menu can be used to associate any material defined to be with any object defined.

If you want, you can “auto”-rename the material (via the “car” icon). The RGB values for the material and its specular components can be altered here.

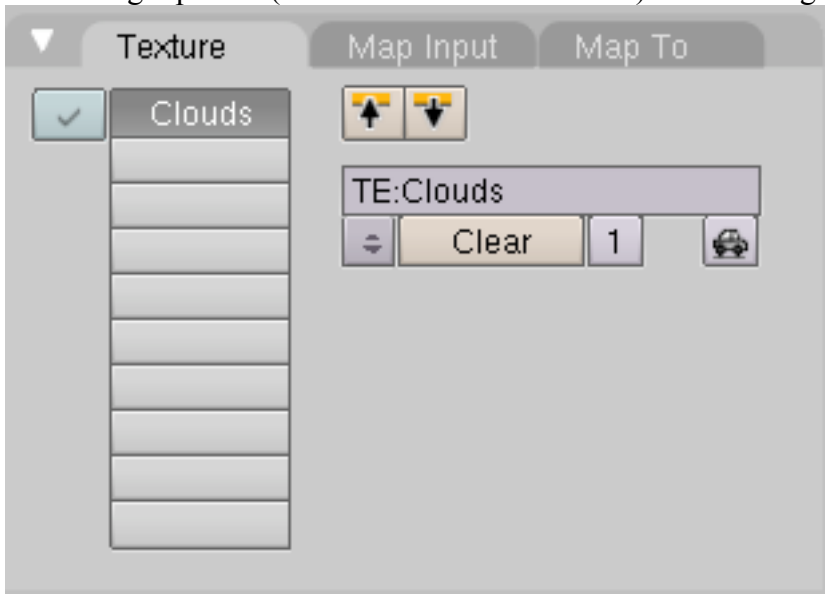
For texturing, select subsubmode Textures:



Add a texture. In the resulting palette, select a cloud texture. Now switch back to materials mode (F5). The result will be a purple (the default color) texture applied to the object.



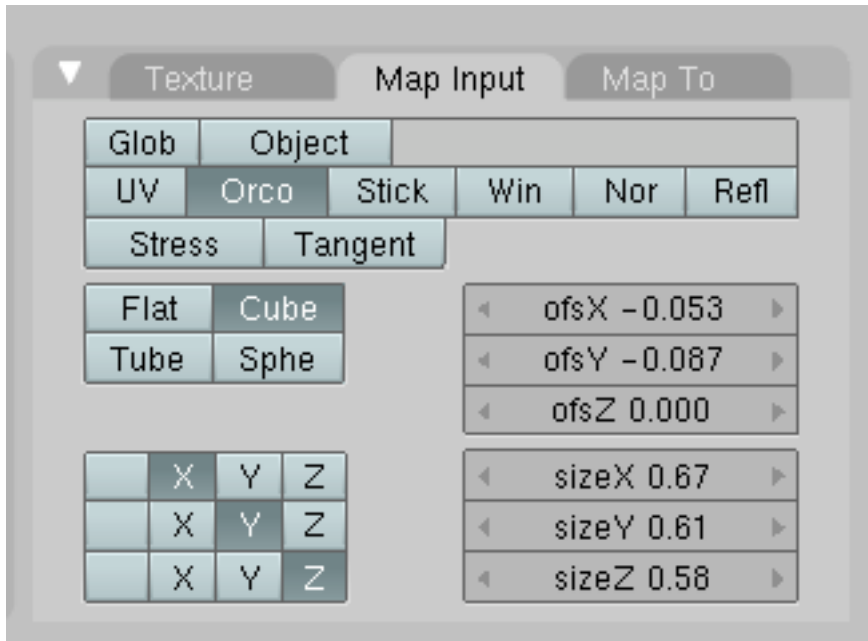
The far right palette (with this texture now active) is something like:



Click on “Map To” and you can see the purple color. Rather than fiddle with color, we’ll just set it to black. (Don’t fiddle with the COL slider, that would turn-off any effect the texture would have on color at all. We don’t want that, we just want the texture to be black. The underlying material color will come through in places.) But there are portions of the texture with an alpha value that allows the underlying material color to come through.

Next, try using an arbitrary jpeg as a texture. Download a wood grain from a web browser as a .jpg. Create a new object. Give it a material. Now add a texture, selecting an “Image” type. “Load image” will now let you browse for the file. Render away (F12). You’ll see that the default uv mapping is pretty simple. One face of the cube looks good, but the sides are simply clamped to the last edge of vertices along the perimeter of the top face.

To play with this problem, go to the Texture palette as before, but this time click on the “Map Input” tab.



Here you can see there are 4 models for how to map the texture to the object. Try switching to Cube. This will apply the image to each of the faces. You can also play with the XYZ keys to change how the X of the object maps to the axes of the texture image (XYZ). The default is isomorphic. The “ofs” buttons allow rotation/offset of the texture image relative to the object face. The “size” buttons manipulate the apparent size of the texture image to the face size.