blender

Blender Special Edition
Volume One   Parts 1 - 10

Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

About Full Circle

Full Circle is a free, independent, magazine dedicated to the Ubuntu family of Linux operating systems. Each month, it contains helpful how-to articles and reader-submitted stories.

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The Blender series begins...

We begin our assembly of Nicholas Kopakakis's Blender series in this Volume.

Here is a straight reprint of the series 'Blender', Parts 1-10 from issues #68 through #82.

Please bear in mind the original publication date; current versions of hardware and software may differ from those illustrated, so check your hardware and software versions before attempting to emulate the tutorials in these special editions. You may have later versions of software installed or available in your distributions' repositories.

Enjoy!

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It's kind of odd to start an article with a Youtube link, but I believe that if you like what you'll see in there, you will love the rest of these tutorials.

Feel free to follow the link below and come back here in about 15 minutes, multiplied by the number of times you'll enjoy it: http://www.youtube.com/watch?v=eRsGyueVLvQ

Sintel (www.sintel.org) is not the reason I mess with Blender, but I believe that if I hadn't till then, after that I surely would have "started my journey".

So, lets talk about Blender (www.blender.org), the program behind Sintel and many similar movies. (Actually Blender is behind a lot of 3D things). Blender is available for Linux, Windows, Mac OS X and FreeBSD (32-bit and 64-bit systems).

When this article was written, the latest version was 2.64 but we'll work with version 2.62, which you can find in the Ubuntu repositories. If you haven't already installed it, go ahead and install it from the repository.

In these tutorials we will use a 3-button mouse and a keyboard with number pad. Blender assumes that you have that. But, if you don't, you can change these setting under File > User preferences. Select the input tab and, on the left, mark Emulate 3-Button Mouse and Emulate Numpad.

You will encounter a splash screen showing the version of Blender at the top right corner and some links. Ignore them for now and press any mouse button outside that area.

If you are new to 3D animation software, don't worry. Give it some time and you'll get used to it: practice, experiment, and practice are the only three ways to excel in Blender. If you are familiar with other similar programs (Maya, 3DS Max, etc), you will find some differences but the main philosophy is here.

So, we are in Blender and we see the 3D view editor, some buttons at the left, some buttons and numbers at the right, and a timeline at the bottom. Working in Blender mainly means "working in 3D view editor".

Working in Blender is modeling, animating, lighting, compositing, texturing (where we will use all editors), but the 3D view editor (or 3D view window) is still the place where everything is revealed.

The 3D view editor is the big window at the center of our screen. What you see there is a cube, a camera, and a light.

Press F12

What's going on? Well, you just rendered your first scene in blender!

TIP: You can inspect the previous rendered image anytime by pressing F11. Pressing F11 again

contents ^
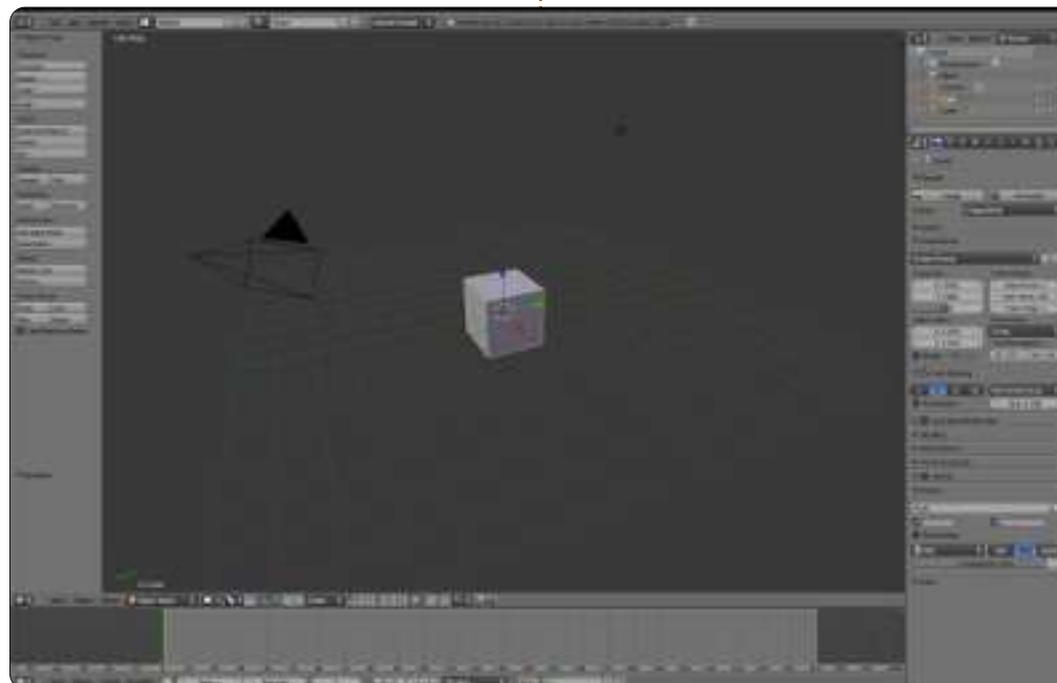
will return you at the 3D view editor.

Move the mouse on the image and press Esc or press F11 to exit the rendered image window and return to the 3D view editor.

All that you need to have a scene is a capture device (the camera), a theme to capture (the cube), and some light.

Now, lets focus on the bar on the bottom of the 3D view (shown below) called Header

Notice the tiny little box (shown left) on the left-most side. This is the editor type selector.

Press your LMB (Left Mouse Button) on the little 3D box to change the editor type.

From the list select Python Console (the very first selection at the top).

Hey! Where is my box?

Don't worry, your cube is right
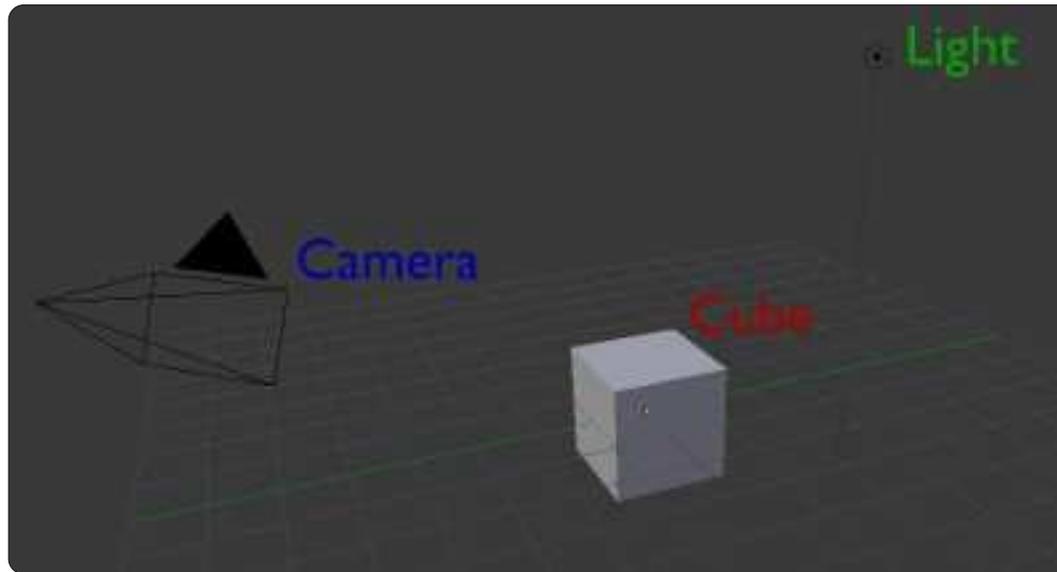
there where you left it. From the same menu select the 3D View. Voilà! Your box is there. See?

In Blender, you can change any window to any editor type window you want. This will be very handy in the future when we will want to be more productive. Go ahead and locate the four other window headers on your screen. (There are five in total.)

Notice that every window has a different header with different options, and every time you change editors, the header changes as well.

Now, change every editor to info (the header at the top of your screen is already in info so you don't have to change it.)

At any time, press File > New in info header to reload your default setup.

Ok. Let's start a new project; press File > New in info header.

Everything is back in place.

Move the mouse in the 3D view editor window, and press the MMB (Middle Mouse Button) while

moving the mouse around. You are rotating the view. Moving the mouse wheel up and down, you zoom in and out.

Alt+Shift+MouseWheel rotates the view up and down.

Alt+Control+MouseWheel rotates the view left and right.

Also you can pan the view. Shift+MMB and you can pan the view, with Shift+MouseWheel up and down and Control+MouseWheel for left and right.

You can zoom in and out without using the middle mouse wheel. Use Control+MMB and move the mouse up (zoom in) or down (zoom out).

Enough with rotation and panning. Lets go to selection!

Start a new project: File > New.

By default, when you start a new project, the cube is selected (indicated by the highlighted-orange edges of the cube)

Now press the A key. You deselect the cube (nothing in the scene is highlighted).

Pressing A key again will select All objects on-screen. The cube, the camera and the light. Press A one more time to deselect everything.

Now press the RMB (Right Mouse Button) on the cube. You select the cube and it's highlighted.

Press the RMB on the light. You have selected the light but you deselected the cube as well.

Press A to deselect the light.

Shift Selection

Press RMB on the light and then press Shift+RMB on the cube. You selected the light AND the cube (notice the more redish edges on the light).

Now Shift+RMB on the camera (notice the redish light). This is cumulative selection, meaning that you added the camera to the selection.

Shift+RMB to the cube.

The redish edges become orange. Shift+RMB again on the cube and you deselected the cube. Now you have in your selection the light and the camera. Press A to deselect all.

Now, using the MMB, rotate the view, in order to see all 3 objects, and deselect all with the A key. (You can instead load a brand new scene by clicking File->New or Control+N, and, on the new project, press A to deselect the cube.)

Box Selection Tool

Assuming that you have loaded a new project or you have a similar view, move the mouse over and right of the light and press the B key. A cross appeared. Now hold LMB and drag the mouse down and to the left in order to Box select all 3 objects.

Great! Everything is selected with a different and faster way than the Shift+RMB selection. Press A key again to deselect all.

Circle Selection Tool

Press C and a Circle appears.

Circle selection works in a cumulative manner like shift selection, so pressing LMB on the cube will add the cube to the selection.

Moving the mouse wheel up and down, you can adjust the circle radius making selection more precise or general.

Remember, any time you press LMB you add the object to the current selection.

Press MMB to remove an object from the selection.

Press Esc to exit the selection mode.

Lasso Selection Tool

Press and hold Control+LMB and drag your mouse to put the border around an object. You can select multiple objects in a more accurate way than the box selection.

You can add objects to the selection with the Control+LMB, and you can abstract objects from

the selection with the addition of the Shift key to the combination: Control+Shift+LMB. Press and hold Control+Shift+LMB and abstract objects from the selection.

Go to File->New or press Control+N. Start a new project.

Practice, Experiment and PRACTICE! Rotate the view, pan the screen, zoom in, zoom out, make multiple selections and deselections.

Next month, we will actually create something.

Go to http://www.youtube.com/watch?feature=player_embedded&v=R6MlUcmOul8

Enjoy "Tears of Steel" (www.tearsofsteel.org) by the Blender Foundation.

Nicholas lives and works in Greece. He is working for a post-production house (commercials - films) for several years. Three months ago he migrated to Ubuntu because "it renders faster". Blender found him two years ago.

As I promised last month, today we are going to create something. But first let's destroy a cube!

Start a new project in Blender: File-> New, or just open Blender.

Press Numpad-1 to have a front view. At the upper-left corner you can check what you are viewing.

Now press Numpad-5. You change your view from Perspective to Orthographic. Pressing Numpad-5 toggles the view from perspective to orthographic and vice-versa.

TIP: Perspective view is the way our eyes see the world. Objects that are closer seem bigger than objects that are further.

Orthographic view, on the other hand, is like seeing an object from an infinite distance. All objects seem as they are at the same distance relative to the eye. Orthographic projection is a means of representing a three-dimensional object in two

dimensions (http://en.wikipedia.org/wiki/Orthographic_projection), very useful for modeling!

On the bottom left image, we have an orthographic view. Our brain cannot understand which side is the front. But it is great for creating models, as we don't actually care for one perspective but for the actual dimensions of our model. The perspective is going to be more realistic if we create models ignoring the perspective!

In the bottom right image, we see the cube from perspective view, so our brain can understand
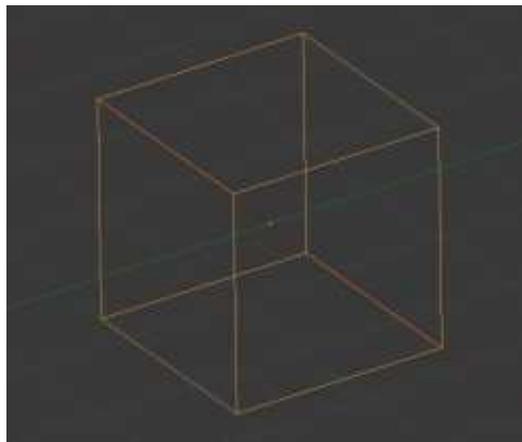
which side in nearer, knowing that is a cube.

Of course, this is my opinion. Maybe you can model better and faster using perspective view. It's up to you.

A few months ago, Mark started to demonstrate the great program Inkscape (we will see in the future how we can use Inkscape with Blender) creating a snowman. I really liked his example, so let's create a snowman as well. But first, destroy the cube!

Select the cube with the RMB (Right Mouse Button) and press the X key or Delete key and
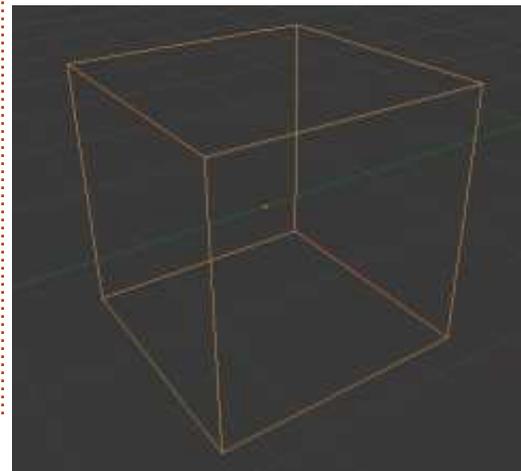
confirm the destruction by pressing Enter.

Now press Shift+A to add something, and, from the menu, click Mesh->UV Sphere or, from the header, press Add->Mesh->UV Sphere to add a new mesh to your scene. A sphere appears.

I guess that you are in front-orthographic-view (check the top left corner on your 3d view window) with the sphere selected. If not press Numpad-1.

Press Shift+A to add a new mesh. A UV sphere again. You don't see any difference in your monitor. Don't worry. LMB and hold the blue arrow pointing upwards, to move the sphere up on the Z-axis. Place it near the top of the revealing sphere.

Press S to scale down the sphere moving your mouse to the center of the cursor. Move your sphere down again to be a little "in" the big sphere.

Now press Shift+D key to

duplicate the selected sphere. Press Z to lock the movement to Z-axis, and press and hold LMB to move it up near the top of the second sphere.

Press S and scale down the third sphere.

Ok, we have something.

Press File->Save As to save your work so far. Select where you want to save your file, give it a unique name (snowman.blend for example), and press the Save As Blender File button on the upper right corner. Great!

Now, select the first sphere by pressing the RMB on it. Press S and then Z to scale down your sphere altering only the Z-axis.

Do the same for the other two spheres to make them look more "real" (shown middle left). The gravity pulls the snowballs to the ground.

Press N to open or close the properties window on the right of your 3D view. There, you can inspect and alter your object's properties by actual numbers (shown middle right).
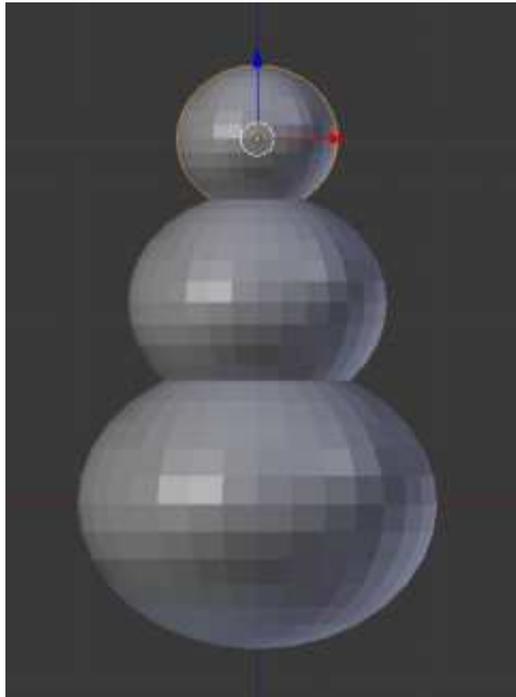
On the Front Ortho view, press LMB somewhere right of the snowman body. Press Shift+A to add Mesh->Cone. Press R for rotation, and 90 for the rotation degrees.

TIP: You can manually input values by pressing directly a value. Your cone rotated 90 degrees clockwise. You can also use negative values for rotating your object counter-clockwise.

Press Numpad-3 for the right view. Press S for scale and Shift+X to constrain the X value and alter
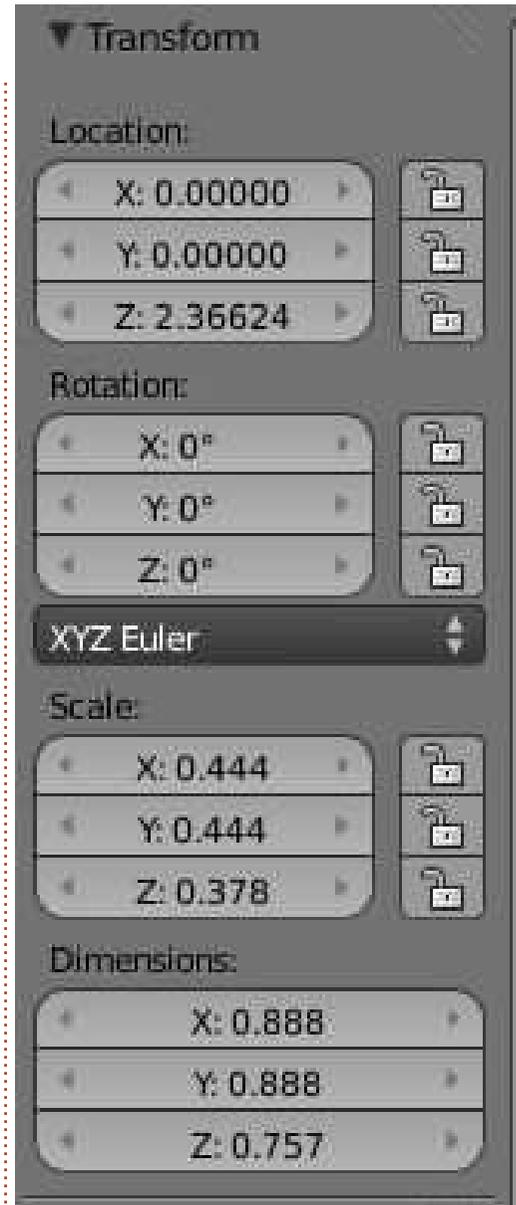
the Y and Z values together. Scale the cone down to look more like a carrot-size nose relative to the third-created (snowman head)

sphere.

OK, press Numpad-1 for front view, and press S and X to alter the X value alone. Now create a long or a short carrot-nose.

Press R and -10 to rotate the nose 10 degrees counter-clockwise.

Using the front view and the right view, place the nose somewhere in the middle of the snowman's head.

Now let's create some buttons. Press Shift+A to add a Mesh->Cylinder. Use the same tools to create a little coin-like button as the ones we use to create the carrot-nose. Scale it, rotate it, use your imagination! Don't forget to duplicate with Shift+D to be more productive.

When you are happy with your model, save your work.

Press F12 to render.

Your snowman seems a little bit silly. The snow doesn't have this kind of edges like well crafted crystals! We have to smooth that up.

So, press T key to bring up the toolkit on the left. Under the Shading section, you have two options: Smooth and Flat. With one sphere selected (or all) press the Smooth button. Your snowman is smoother now!

You can see the differences. On the image shown middle right, the spheres are flat with a more crystal like cut, and on the one shown middle left, we have applied the smooth shader giving a more smooth and natural feel of snow.

Using the box selection tool that we mentioned last month, select all objects that, united, represent "the snowman". The spheres, the cylinders, and the cone.

Using the blue arrow, move the snowman up as shown in the images above, a little bit down the red axis.

Press Shift+S. From the Snap menu that appeared, select Cursor to Center. Press numpad-7 for the top view. Press Shift+A to add a new mesh. A plane. Press S for scaling the plane and 10 to scale it up 10 times.
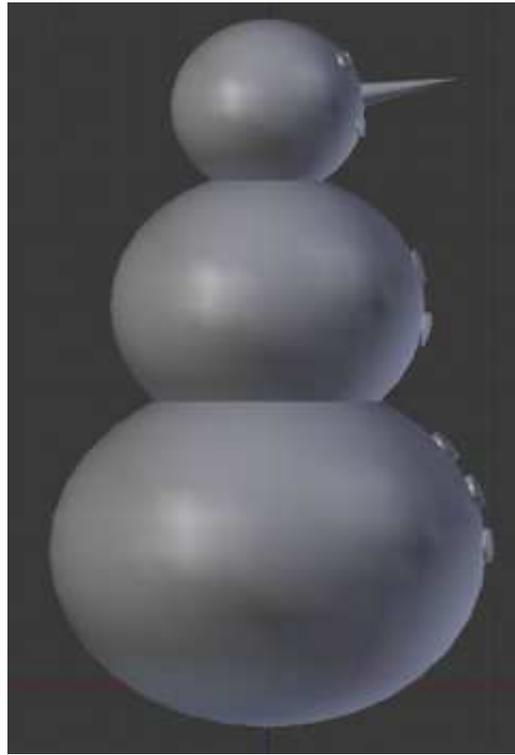
We have a ground.

Save your work under a unique name.

Render your snowman by pressing F12.

If your camera doesn't capture your model as you like, move your camera.

Every month, I'll suggest an interesting site for Blender. For this month, I highly recommend http://www.Blendernation.com. A very useful site with hot news about Blender.
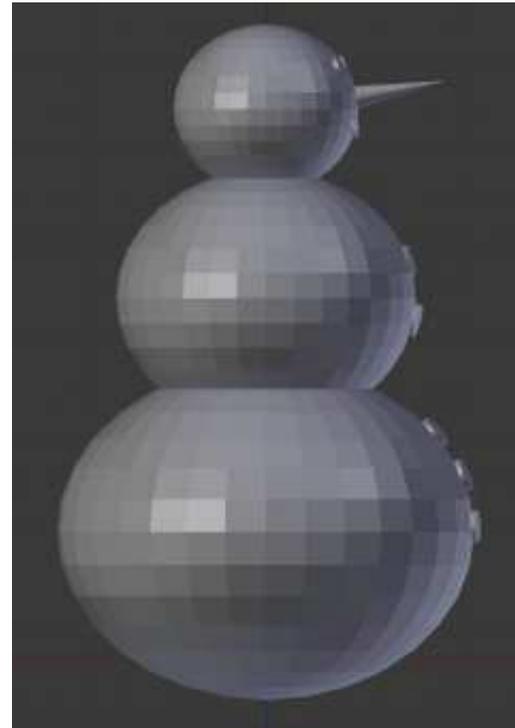
Also for this month I have a video for you. Go to http://www.youtube.com/watch?v=TLkA0RELQ1g, and enjoy "elephants dream" a short film created with Blender in 2006, by orange open movie project.

Next month, we will add a hat, maybe a pipe, and his brush-like hands. Also, I will introduce you to the edit mode – the place where you are going to spend most of your Blender time!!
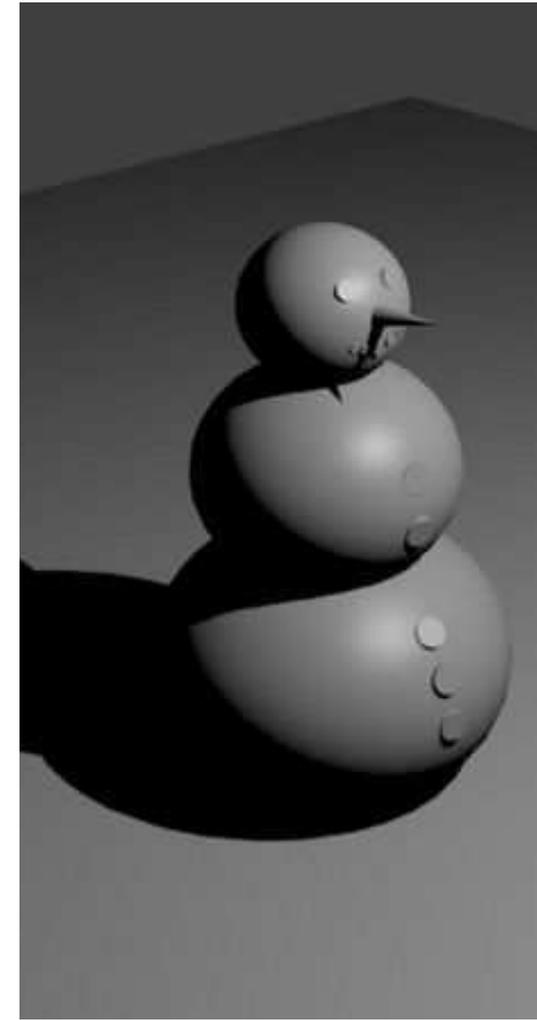
Nicholas lives and works in Greece. He is working for a post-production house (commercials - films) for several years. Three months ago he migrated to Ubuntu because "it renders faster". Blender found him two years ago.

Many, many times in your blender sessions you will press the TAB key. It's the keyboard shortcut for switching to Edit Mode.

Load the snowman.blend file that we created last month, and, on the header, locate the button showing that you are in Object Mode (it's called header, but it is placed by default where a footer should be).

Select with the RMB (Right Mouse Button) the head (top UVsphere) of our snowman.

Press the TAB key. The entire header changes and now you are reading "Edit Mode" on the same button. (You can alternatively press that button, and, from there, you can select the edit mode. For now, we don't need to know what the other modes are).

Also the UVsphere changes to a orange-wired sphere.

You are in edit mode. While in edit mode, you are able to adjust and manipulate only the selected object. Try, for example to select with the RMB the lamp or the nose. You can't. You can select only a vertex or group of vertices of the object that you are in.
Vertex is a 3-dimensional coordinate,
Edge is a line connecting two vertices and
Face is the planar field in between 3 or more vertices.

In edit mode, you can select vertices, edges and faces – the same way we saw in the first part of this series, 2 months ago. Use the box selection tool, the lasso tool, the circle selection tool, RMB and Shift+RMB to select multiple vertices.

Also in the header, observe three small buttons representing the vertex, edge and face selection.

From these buttons you can change what you select (vertex, edge or face). Alternatively, press the keyboard shortcut Ctrl+Tab.

Go ahead and switch back to object mode by pressing the TAB key.

On the header again, you can see that the buttons that we mentioned before have disappeared, and some others came back. Let's focus for a minute on the buttons showing below
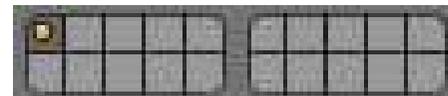
These are called Layers Buttons. The yellow dot in the upper left button indicates that we have objects in that layer selected, or recently selected, and the darker gray color that we are currently in that layer.

Press the number 2 on your keyboard (NOT the numpad) or the second button from the upper left corner. Everything disappears – as we are now on a different layer.

Press Shift+S for Snap menu, and select Cursor to Center. Press Shift+A to add a new object. From the Mesh group select Cylinder. Notice now the Layers Buttons.
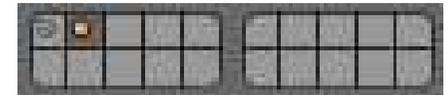
It shows us that we have objects in two layers, and the second layer is the active one with something selected. Press S for scale, and 0.3 to scale it down 30%. Press G for grab, Z to lock it to Z-axis, and 0.3 to move your cylinder up 30% of a blender unit.

If it's not selected already, press Numpad-5 to switch to orthographic view (explained in issue #69) and Numpad-7 for top view.

Press the TAB key to enter the edit mode. Press Shift+S and Cursor to Center to move your cursor again to the center of your grid – in case you have moved your cursor. Press Shift-A to add a Circle from the Mesh group. After that, press F6, and, from the window

that appears, change the Fill Type from Nothing to Ngon. After that, press S for scale, and 0.5 to scale down your circle by 50%.

Press the TAB key to return to object mode. While in edit mode, the objects that you add (in this example the circle) are all parts of a single object and blender manipulates them as a single object.

We have the hat. Now let's create the hands of our snowman. Press 3 on your keyboard (NOT Numpad-3) to work in Layer number 3.

Shift+S again to move our cursor to center. Shift+A to add a new Mesh. A cylinder again. Press S for scale, Shift+Z to keep the dimensions of Z-axis, and alter the other 2 axis, X and Y. Press 0.02 for scaling 2%. After that, press S again, Z to alter only the Z-axis

dimensions, and 0.5 to make it half long. Lets go to edit mode again. With the cylinder selected, press TAB. Add a new cylinder, scale it down, rotate it, and move it in order to create a branch arm.

When you are done with your branch, Press Alt+1 on your keyboard (NOT Numpad-1) to select Layer Number 11.

TIP: Press 1, 2, 3... to 0 on your keyboard: you select your active layer from 1 to 10. This is the upper row on your Layers Buttons mentioned earlier. Pressing Alt+1, Alt+2... to Alt+0 selects the lower row of layers from 11 to 20.

With Layer 11 active, add a new Cylinder (by now you have to know how to add a new Mesh).

Press TAB to switch to edit mode. Press Z key to display your cylinder as wireframe. This is a very useful view of your object, and I personally use it a lot to toggle the view from solid to wireframe. Press A to select all vertices (if not already selected). (When in object mode, pressing the A key selects all objects, but, when in edit mode, this key selects or deselects all vertices.)

Now it's time to create a pipe.
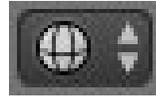
Assuming that you have a front orthographic view, and the small button on the right of the mode selection button indicates the wireframe symbol...select all vertices.

Scale down your cylinder to 8%.

Press A to deselect all vertices. Now, box select (using the B key) only the upper vertices.
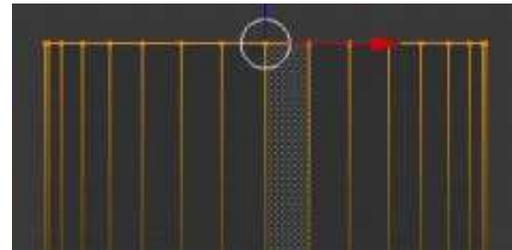
Scale up a little by pressing S key and moving your mouse away from the center of your selection. Press A to deselect all vertices, and box select the lower vertices only.
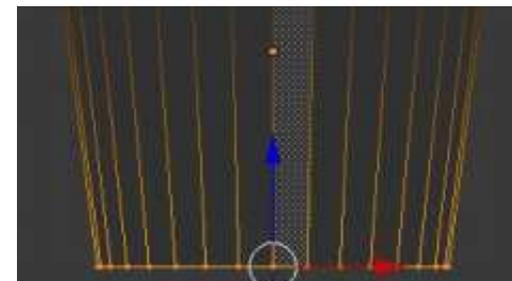
Scale down a little by pressing S key and moving your mouse towards the center of your selection. After that, add a new cylinder, scale it down, and create the rest of your pipe.

It is a good time also to replace that nose that we did last month (using a cone) with a new one based on a cylinder – because we don't actually want a so sharp edge for our carrot-nose.

Now we have almost what we need.

Do the same as we did with the cylinder a little earlier to create another branch arm. Place it in a new layer or in the layer where you have the other branch. You can also duplicate your branch arm by selecting it and pressing Shift+D.

Now that you have all the elements in your layers, you can either move all objects to the starting layer (Layer 1), or by pressing Shift and the Layer-

buttons that have objects in them – to combine the view of all layers that are selected.

TIP: To move an object to another layer, select the object and press M key. From the Move to Layer window, select where you want to move your object.

Next month, we will add some color in our lives, introducing textures!

For this month, I'll suggest http://www.blenderartists.org – a forum where you can find the latest news, job ads, artworks, and much more blender-related stuff.

Also for this month, I have a video for you. Go to http://www.youtube.com/watch?v=USyoT_Ha_bA, and have a look back in 1963 at the ancestor of all computer graphics, Ivan Sutherland's Sketchpad (my Wacom tablet almost cries).

Nicholas lives and works in Greece. He is working for a post-production house (commercials - films) for several years. Three months ago he migrated to Ubuntu because "it renders faster". Blender found him two years ago.

CODEWORD

Every number in the grid is 'code' for a letter of the alphabet. Thus the number '2' may correspond to the letter 'L', for instance. All - except the difficult codeword puzzles - come with a few letters to start you off

Solutions are on the second last page.

Puzzles are copyright, and kindly provided by, **The Puzzle Club** - www.thepuzzleclub.com

Textures and materials are very crucial. Without them, for example, what we have created so far is a grey snowman, with a grey nose, grey hands and a grey hat. Not so realistic. So, materials and textures is a way to add realism to the look of our models with images, plain colors, etc.

You must have a material to apply a texture on it (by default blender adds a material to your objects in order to see their surfaces).

So, for this month we will introduce materials – leaving textures for next month, as it is impossible to fit them both in an article.

But, before anything else, let's upgrade blender. A new release (2.66a) is available at http://www.blender.org/download/get-blender/ with a bunch of new features and over 250 bugfixes.

Let's load the snowman blend file that we created last month. It has to look something like this in object mode (shown below).

Notice the small icons at the right of your 3D view window. The fourth icon from the right (highlighted) is the Materials tab.

Select the hat and press the New button:

Name your material "Hat". Your material tab has to look something like the one shown right.

As you can see, there are a lot of things that we can tweak, but we will introduce the very basics to create a kind of realistic environment (maybe, in a later stage of this article-series, we can focus on materials and textures explaining all in detail, but, for now, feel free to experiment with those).

Blender gives us a preview window where we can inspect the

contents ^
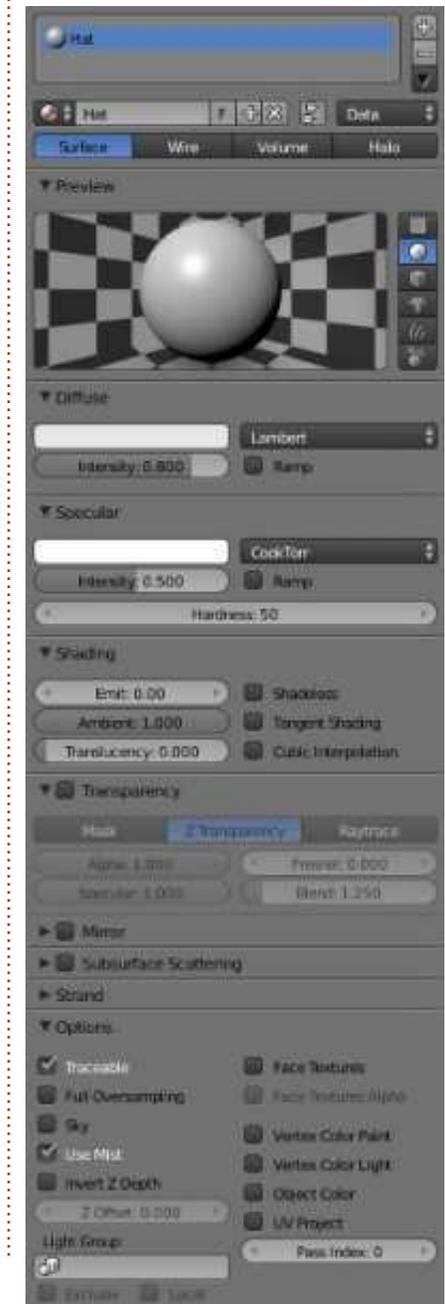
color of our material. Also, on the right, we can change the basic object that we are previewing (this doesn't affect our object at all, but helps us to understand how the color looks – for example on spheres or boxes).

Under Diffuse, there is a white strip. Press with your LMB (Left Mouse Button) on it to change the color. Select the color of your choice from the color wheel, or enter manually the values of Red, Green and Blue below the wheel, or you can use the color picker – well known from other graphic applications.

You can use the HSV button to choose your color by Hue Saturation and Value, or you can use the Hexadecimal numbers that are commonly used on web pages to specify colors. I personally use only the RGB values. The values can vary from 0 to 1 indicating the percentage of the color (0.2 = 20% for example).

On the right of the wheel there is a slider controlling the intensity of the color. If you slide it all the way down we have absolute black. Also notice that values of Red, Green and Blue are all changed to

0.

Under Specular, there is also a white strip. From there we choose the color of the reflection on shining objects. For example choose for diffuse: color Red = 0.015, Green = 0, Blue = 0.24, and for specular: Red = 0.915, Green = 1, Blue = 0.

Also on the preview window, change the basic object to monkey.

Looks like the image below?
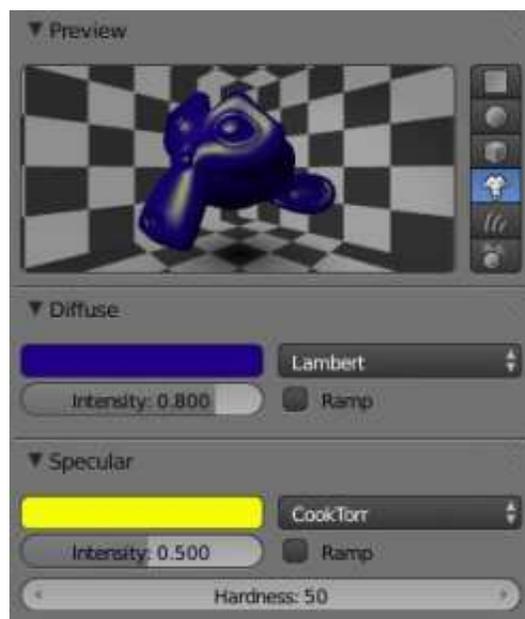
NOTE: The monkey of blender is actually a chimpanzee, called Suzanne. This 3d mode, created by Willem-Paul van Overbruggen, was introduced to the blender community as a test model for materials, textures, lights, etc. The Suzanne awards (something like the Oscars awards) are held annually for blender artists. http://en.wikipedia.org/wiki/Suzanne_Award

Now, let's go back to our snowman. Reload the snowman.blend file, select the plane that we use as ground and LMB on the material tab.
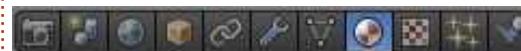
Press New to create a new material and rename it from "Material" to "Ground".

Under Diffuse, press LMB on the white strip and put the values 0.5 for Red and Blue and 0.8 for Green. On the 3d view window, you can see that the color of the ground changes to a green looking surface.

Select one button of the snowman, and press the new Button on the material tab. Name it "Button", and, under Diffuse, color it red (by now you must know the way to do that, but, in case you don't, just put R = 1, G and B to 0):

Now, with your RMB, select another button of the snowman. Under the material tab, you can see the New button that we used earlier to create a new material. Left of this there is an icon similar to the "materials" one in blender.

Press it and select Button from the list:

The materials that we create are stored for later use in the blend file, and many different objects can share the same material.

Keeping that in mind, create materials for the hands, the hat, the nose, and the pipe. Also assign the Button material to the other buttons, or create a new material for each button if you like.
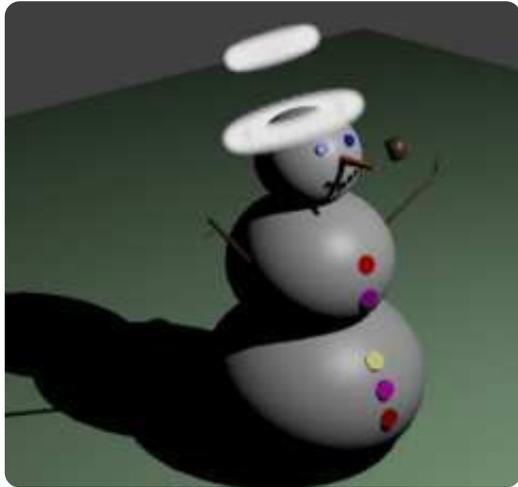
For the hat I created a material with a Halo behavior – just to make a Saint snowman with two Halos!!!! Very Saint!

You can experiment with the other two kinds of materials behavior: Wire and Volume.
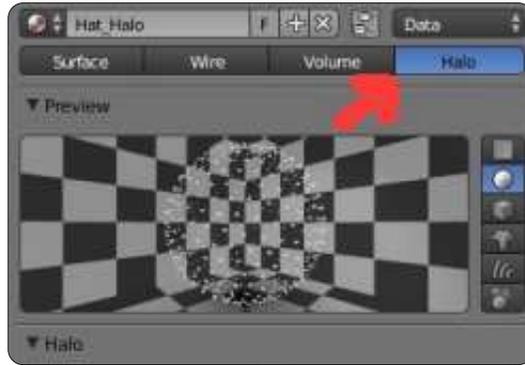
For this month, I recommend that you download and play a game created in blender with the blender game engine. Yo frankie! http://www.yofrankie.org/

Also you can check out blenderguru.com. A site dedicated to blender, with a lot of tutorials for beginner and advanced users, created and hosted by Andrew Price, a very talented blender artist. Enjoy. http://www.blenderguru.com

Nicholas lives and works in Greece. He is working for a post-production house (commercials - films) for several years. Three months ago he migrated to Ubuntu because "it renders faster". Blender found him two years ago.

CODEWORD

Every number in the grid is 'code' for a letter of the alphabet. Thus the number '2' may correspond to the letter 'L', for instance. All - except the difficult codeword puzzles - come with a few letters to start you off

Solutions are on the second last page.

Puzzles are copyright, and kindly provided by, **The Puzzle Club** - www.thepuzzleclub.com

Having a lousy model is not something that you want for your models, of course, but, as a good friend of mine (and experienced 3D artist) told me: "you can save a lousy model with good texturing."

This month, I will try to explain the very basics of texturing (the truth is that I know the very basics). There are a lot of books out there describing texturing techniques—as textures are a very important matter for 3D modeling.

Low poly is a polygon mesh in 3D computer graphics that has a relatively small number of polygons. We usually use low poly models for performance reasons, in real-time applications such as games.

High poly models are usually used for animated movies or high detail pictures, in conditions, in general, where we don't have real-time performance restrictions. (http://en.wikipedia.org/wiki/Low_poly)

I will give you an example to make it more clear what textures are and what they are capable of.

In the image below, we have a sphere with a plane, and illuminated by 3 lights.
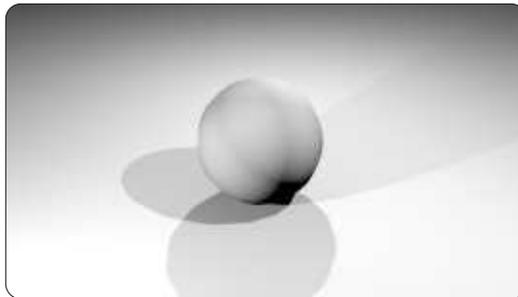
Next, we have the same objects, but this time with textures and image mapping to create the surface filling on earth.

Next, we have the same objects with different textures on them.

And, finally, we have ball of aluminum foil garbage on a beach (very sad).

For the last picture I used an image for the sand, and, for the foil, the cloud texture with some normal map displacement.

But enough with the examples. Let's load our snowman.blend file.

Select the three spheres (body) of our snowman, and press Ctrl+J to Join the three meshes to one. Name it "body" under the object tab.


Now, go to the material tab and press the New button to create a material for the body of our snowman.

Name the material with a unique name—for example, "body_Material".

Next, press the tab next to the material tab called Textures.
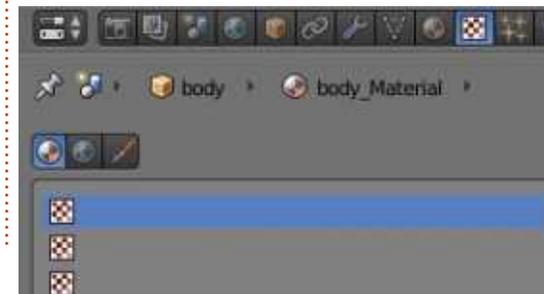
Press New to create a new texture. Name it body_Texture, or whatever you like.

Find a picture of snow to use as a texture. There is a very interesting site that I use a lot at http://www.cgtextures.com. You can register and have access to thousands of images that you can use as a texture (with the free registration you can download up to 15MB of images per month. Download the low resolution images and you will be just fine). For our snowman, I downloaded the image Snow0041_5_S.jpg.

Under the type button, select image or movie.

Then press Open under the Image section, and navigate to your file system to select your image.
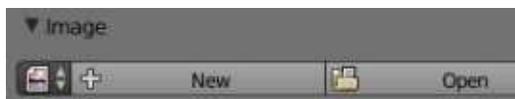
Under the Mapping section, select Sphere for the Projection and leave Coordinates as it is (Generated).

Under the Influence section, tick on Emit and put the value -0.800 to light up your image a little, and, under Geometry, tick Normal and enter 4 for value to give a hard surface feeling.
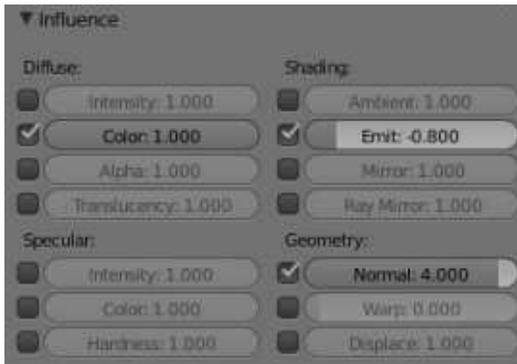
Leave the rest to default, or experiment with them to see what you get (remember that experimenting is one of the three things that you need to master blender, the other two are practice!).

Now, for the ground, here's what I have done (of course, you can use an image instead). I created a texture from the type Clouds, adjusting some of the settings.

with these settings:
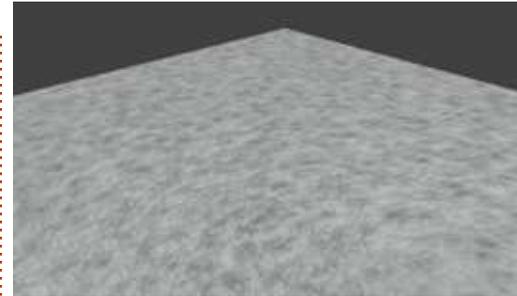
Finish the snowman by creating and applying textures to the rest of the meshes (hands, nose, mouth, etc.)

Feel free to send me your creations of the snowman project at blender5d@gmail.com, and I'll present the best here at Full Circle Magazine.

Next month, I'll introduce you to the Cycles render engine—a very powerful renderer that has been included with the blender distribution ever since version 2.64. Also, we will start a new project. Send me your ideas.

For this month, I have a game called Dead Cyborg created by Endre Barath (http://www.deadcyborg.com). Another game created with the blender game engine. Enjoy!
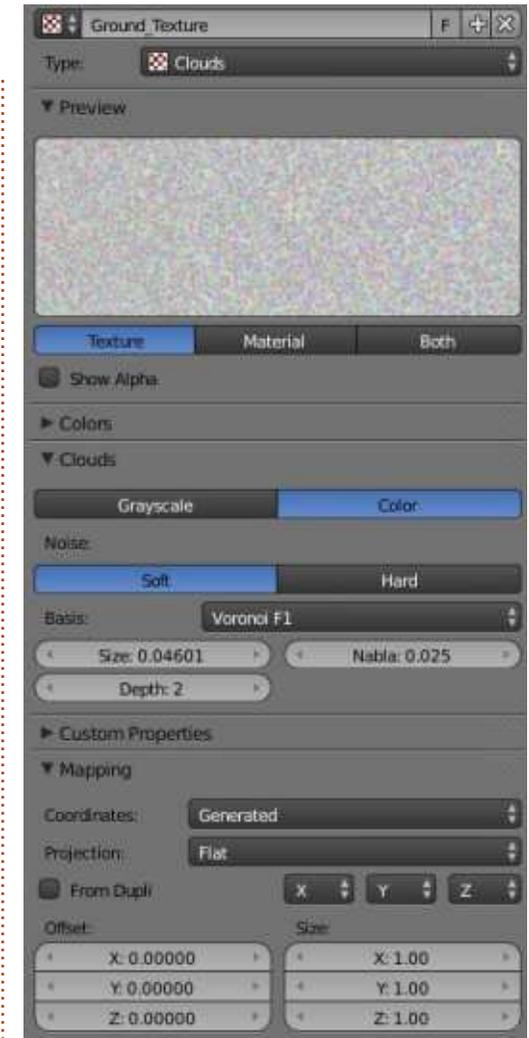
Nicholas lives and works in Greece. He has worked for a post-production house for several years and migrated to Ubuntu because "it renders faster." You can email him at: blender5d@gmail.com

By default, blender has its own renderer called Blender Render, but my favorite is one called "Cycles". It is included as an enabled add-on since version 2.64 (we are now at 2.67), and I find it fantastic because among others things, you can actually see the rendered result of your models in real-time!

But, first things first. Locate at the top of your blender window the pull-down button that says "Blender Render".

Press it to open the menu and select "Cycles Render".

Now, let's arrange our windows to take advantage of the interactive cycles renderer.

On the upper right corner of the 3d view window (main window), press the LMB and drag the mouse left to create a new 3d view
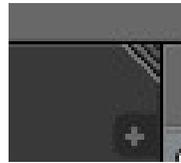
Then do the same with the left window that you have, but this time drag the mouse down to create a third window. You must have something like the image below.

Move the mouse on the upper left window, and press Numpad-0 to have camera view on it.
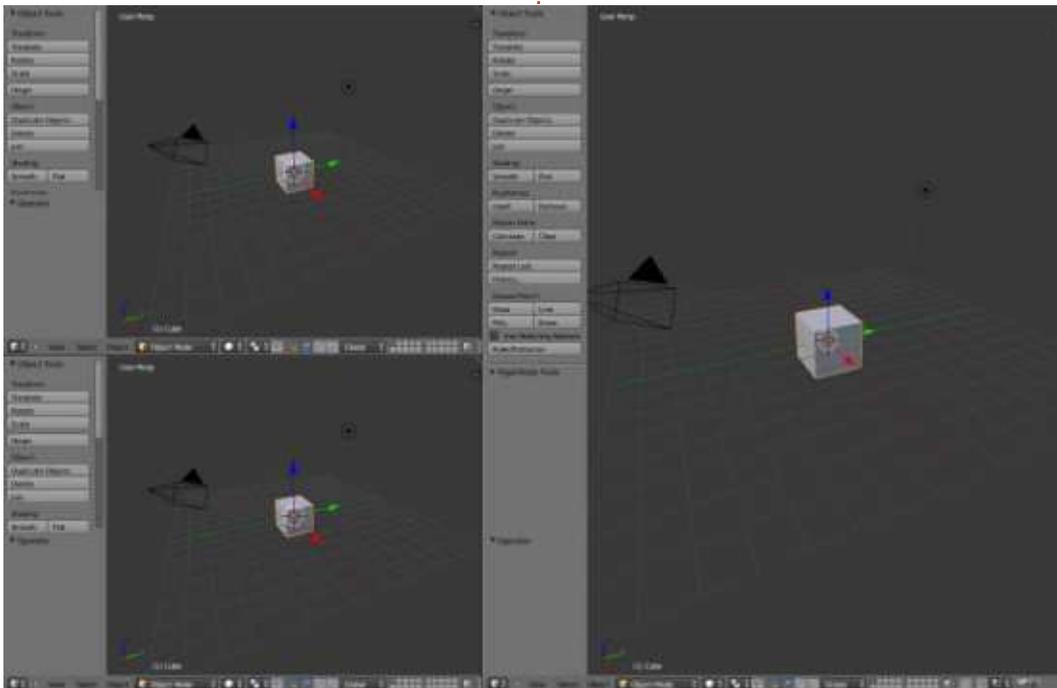
On the lower left window, press the small white sphere next to Object Mode button to display the Viewport shading menu
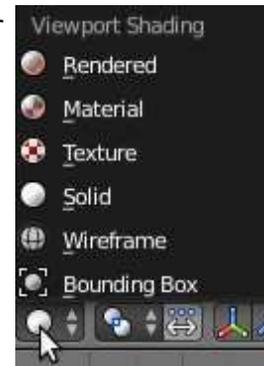
From that menu select "Rendered".

Now, what is actually happening is that, in this window, the cycles render engine creates "on the fly" a photorealistic image of your model. You can navigate in that window, you can zoom in or zoom out using the mouse wheel or +, - from the numpad, you can pan the view by holding the shift key and moving the mouse, rotate the view by holding the middle mouse button and moving the mouse, and, in general, any movement of the view that we examine in part one (FCM#68) of these articles.

This is a good time to save our setup. On the info header (the one that by default is the upper window), locate the screen button with the "Default" value in it (foolishly named, as a bunch of setups are the defaults in blender).

By pressing the small icon on the left (red square), you can select from a list of default setups. Press the + sign next to "Default". A "Default.001" value appears. Change it to a distinctive name for example "Model" to indicate that you use this setup when you model

objects. Then save your file with a unique name, I saved mine as "Basic_shapes.blend". The next time you open this file, the "Model" setup will be opened as well.

TIP: If you start a new project, or load an old one, your custom setup will NOT be there. Just the defaults with blender. To have your custom setup available anytime you start a new project, you must save it as the startup file by pressing Ctrl-U. Note that if you overwrite the startup file (by pressing Ctrl-U), ANYTHING that you have changed will be saved as well. For example, if you delete the cube and you overwrite the startup file, then the next time the cube won't be there! Of course you can revert to the original startup file (File > Load Factory Settings).

Move your mouse over the right 3d view window, and press Numpad-5 and Numpad-1 for Orthographic Front view. Grab the blue arrow of the cube and move it up just over the grip as shown:
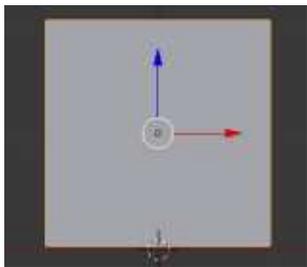
Press Shift-S and select Cursor to Center if it isn't already or Press Ctrl-C. Now add a plane and scale it up by 10 times (by now you must know how to do that). Create a Cone and a UV Sphere. Also smooth them. Move them in order to have them in good view on the upper left 3d view window (the camera view window).

Like the image below.
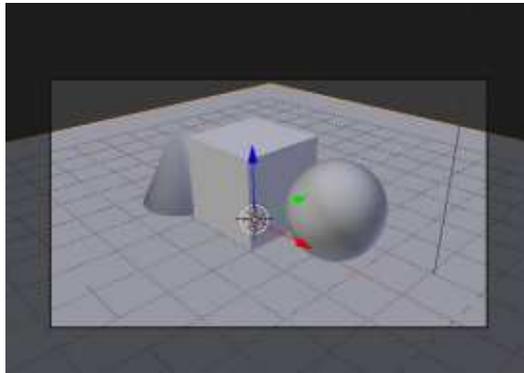
Select the plane and press the material tab on the right under properties window (shown top right).

A different set of things to tweak than the Blender Render! Press the New button (as in Blender Renderer) to add a new material. Name it "ground". Under Surface, you see the default value that is "Diffuse BSDF". This is like the Diffuse that we used in
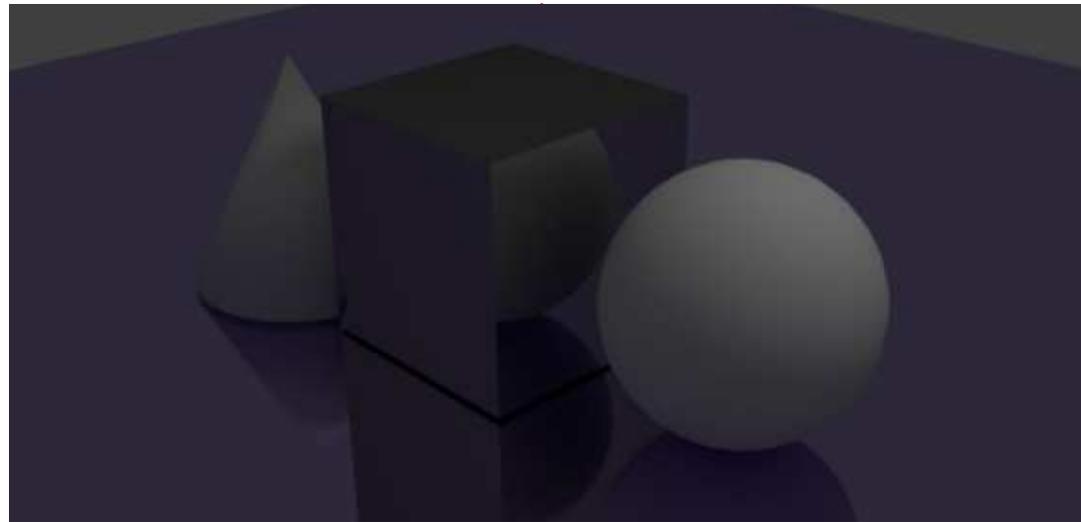
FCM#72 to paint our objects. Press it and from the menu select "Glossy".

Almost instantly (depending upon your CPU power) you can inspect the Rendered 3d window what you've achieved so far. Impressive for just few clicks! Now, if you like, press the color button and assign a color to your glossy, mirror like, surface. I made it purple (R:0.5,G:0.4,B:0.8). As you change the color, Cycles starts to render the result. You have a preview really fast.

Now select the cube, add a new material, and set the surface type

to Anisotropic BSDF to give a metallic feeling to our cube. Maybe my favorite material shader.

Above is what we have so far.

More on this subject next month...

Nicholas lives and works in Greece. He has worked for a post-production house for several years and migrated to Ubuntu because "it renders faster." You can email him at: blender5d@gmail.com

ast month we used Cycles Render to create the image shown below left.

Let's create a similar image (below right) with the Blender engine.

The first thing that we notice (at least me) is shadows. The shadows that our point lamp casts, with blender render, are almost black. This phenomenon is happening because in Blender renderer, the light is been emitted by the lamp only. This isn't realistic, as in the real world every object emits or reflects light.

On the other hand, Cycles renderer calculates the light that every object has from the surroundings. You can observe the cone and see how the shadow from the cube smoothly fades (contrary to the cone from the Blender renderer), and we have a mirroring ground and a shiny metal cube in our scene.

One other thing that is very crucial, and a main difference between Blender and Cycles, is more technical.

Navigate to File > User Preferences > System (above).

At the lower left corner of the System Tab you can check if your computer has Nvidia CUDA support under Compute Device

My GPU has CUDA support so I can enable it. You can also check it at the official CUDA support url: https://developer.nvidia.com/cuda-gpus

If you are lucky and have an Nvidia CUDA card, you have to enable it under the Compute Device Tab that I mentioned before AND under the Properties Panel, Render Tab -> Device -> GPU Compute in order to have the full power for your rendering.

about Cycles. Open the .blend file that we started last month, or just create a new one. Don't forget to check that the Cycles Render at the top is selected
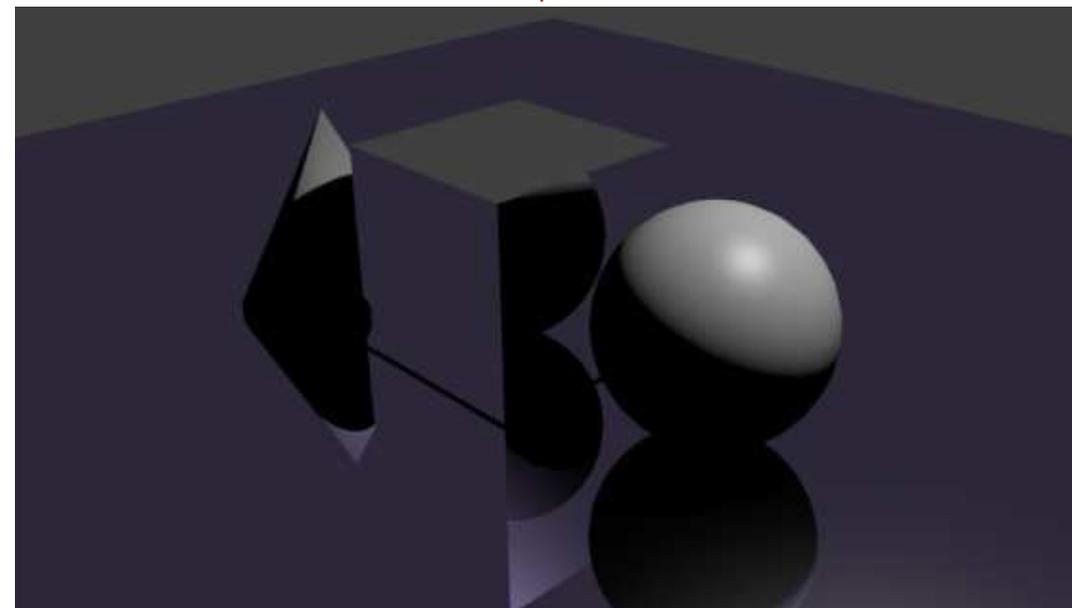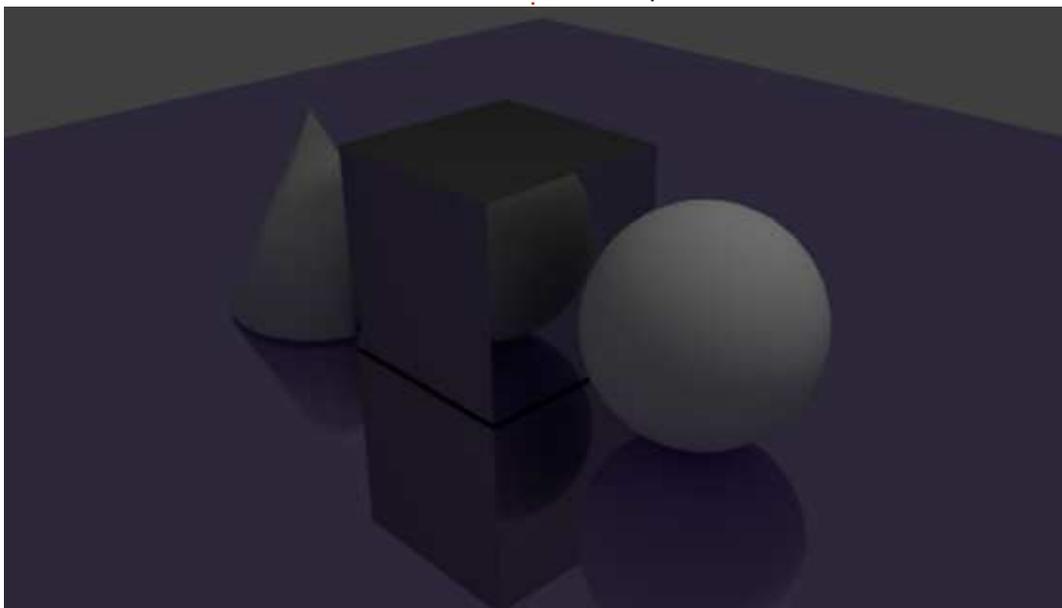
Cycles can use your GPU CUDA cores to render, and is much faster than the CPU. Check out CUDA at wikipedia :
http://en.wikipedia.org/wiki/CUDA

If you don't have a CUDA GPU, you can use Open Shading Language, but it's a little bit buggy and I couldn't recommended this method of rendering, for now. In the near future I have a feeling that it's going to be much faster than the CUDA render procedure.

But enough with the technical stuff.

Let's see another great thing

Also change one of your 3d view windows to show the rendered result.

Select the sphere, navigate to the Properties Panel and change the Surface shader from the default Diffuse BSDF to Emission.
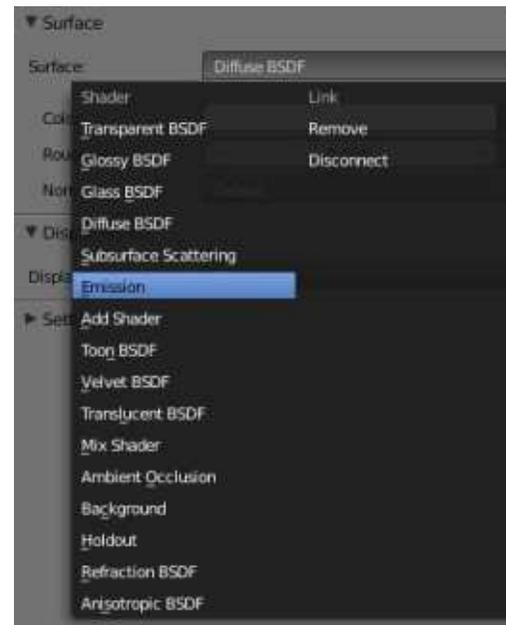
You can check in the Preview window the cool effect that we create. You can adjust the Color and the Strength of the light that your object emits. Also for every shader you can adjust a lot of other things (as textures, for example) by pressing the little dot right next to color and strength values.

Select our metallic-looking cube, press the little dot next to color, and change its texture to Brick Texture. Check the result in your 3d view window and select different textures until you find something that you like.
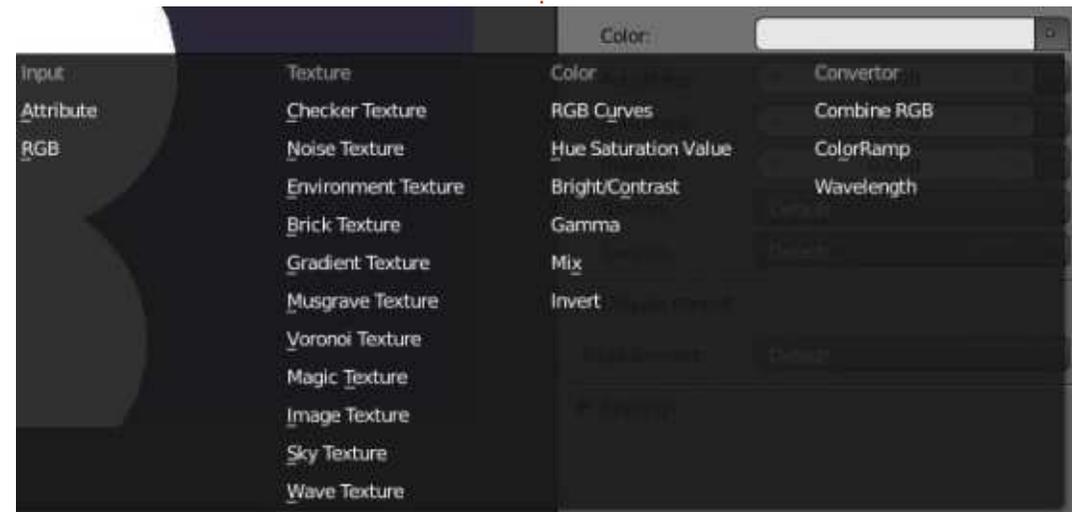
Another interesting shader is the Mix Shader. As you can easily understand from its name, this is a shader that you can use to mix other shaders. Two other shaders to be more precise. So, let's select our cone and change the Diffuse BSDF shader to Mix Shader. Add a Glass shader and a Diffuse shader or a Glossy Shader and an Anisotropic Shader to our cone. Change the value of the Fac parameter to adjust the percentage of the second shader (0.000 means 0% while 1.000 means 100%)

Check the result on your preview window and adjust the settings as you like.

Another thing that I want to mention in this tiny little introduction on the Cycles Renderer, is the use of planes instead of lamps.

Most people working in Blender and Cycles use planes to illuminate their scenes. Looks like more "real world" lighting, and I have no reason to argue with them.

Below is where I am so far.

For this month, follow this link http://vimeo.com/68010380 to enjoy a wonderful work by 3 people and Blender (congratulations goes to Javier Trapiella, Baol Bardot Bulsara and Robert Green).

Also visit www.blendernews.org to enter and share with thousands of professional artists!

http://blendernews.org/xe/?mid=Feature_Articles&document_srl=1274

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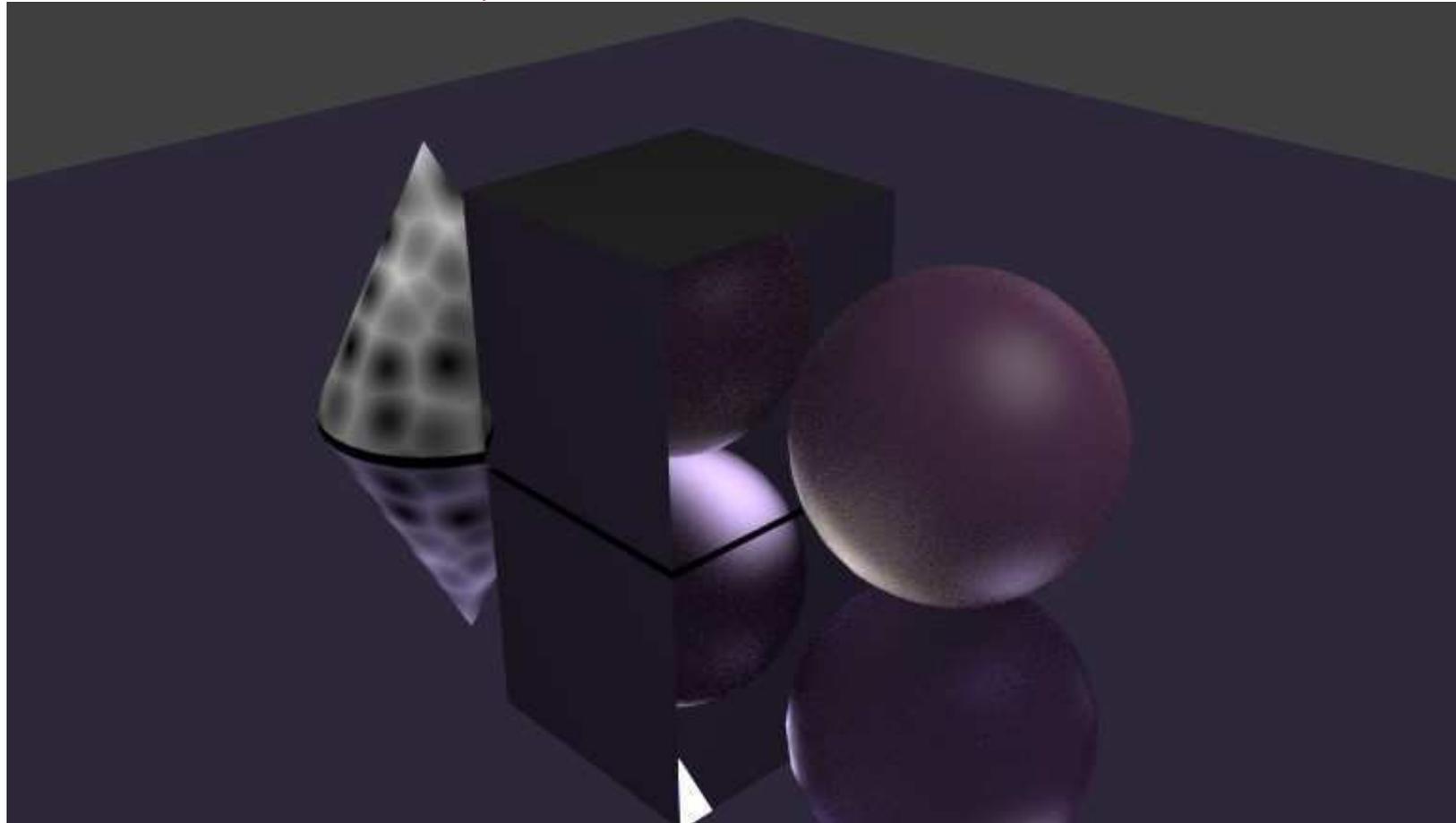
After a month off, we are back together to explore modifiers. One of my favorites is subdivision surface!

Tip: Modifiers are automatic operations that work with how an object looks and renders but without changing the actual geometry of your object.

Subdivision Surface (Subsurf in short) is a method of subdividing the faces of a mesh to give a smooth appearance, to enable modeling of complex smooth surfaces with simple, low-vertex meshes (source: wiki.blender.org).

Open a new project in blender and select (if not already) the cube.

Now, let's look to the modifiers tab (shown below) under the properties window.

Notice a little wrench. This is the symbol of modifiers in blender.
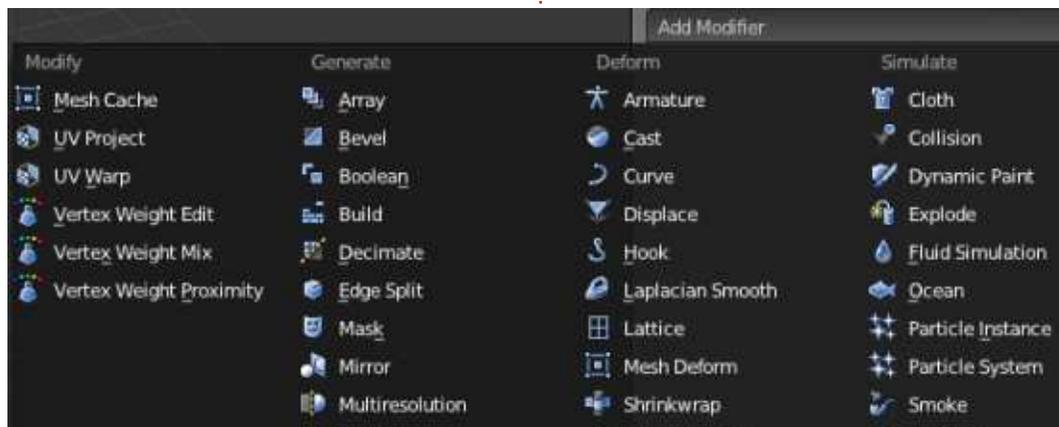
Press with your left mouse button the wrench icon and then press the "Add modifier" button.

A large window appears with all the available modifiers in blender. For now we will stick with the Subdivision Surface (Subsurf from now on). Locate it (highlighted in the image above) and select it to add this modifier to your cube.

Your cube changes to a 24-faces shape! But if you render your image, you will get a 96-faces object... Weird! Let see why this is happening.

When you add the Subsurf modifier to your cube by default the modifier subdivides the cube faces (6 faces) by 4, giving you a new shape with 24 faces. You can control how many times to subdivide your object's faces under Subdivisions section as shown in the image below. The "View:1" indicates that you subdivide your object one time.

There is another control button under Subdivisions section to change the subdivisions when you render your image (Render:2). That's why in the 3D view window you have a 24-faces shape (subdivided one time), but, when you rendered it, you had a 6x4x4=96-faces shape (subdivided

two times). Press the right arrow to increase the View subdivisions to 2. Now what you see is what you render.
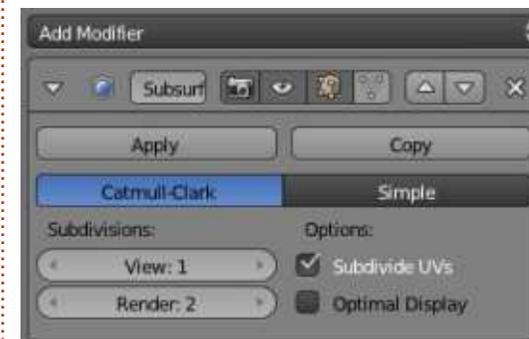
Increase the View and the Render subdivisions by one. Now, under Subdivisions you should have 3 subdivisions for View and for Render:
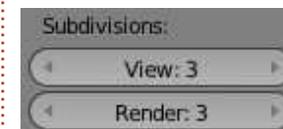

On the left of your 3D view window, under object tools (shortcut T for show/hide), smooth your cube's shading

Your "cube" now has to look something like this:
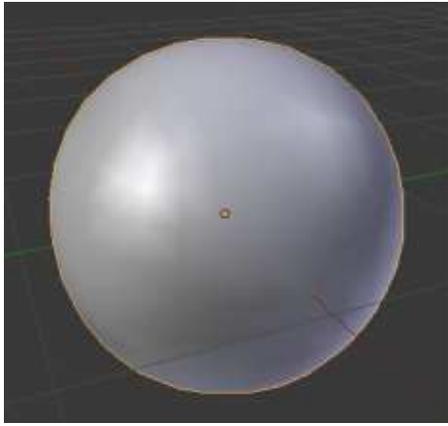
The secret of the power that Subsurf has is revealed when you press the TAB key to enter the edit
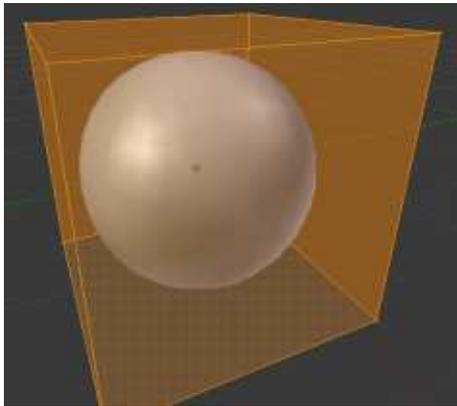
mode

You can see the sphere that we created with the Subsurf, and your original shape, the cube. You cannot edit the sphere (remember that your actual object is the cube) but you can edit the cube.

Select the top face of your cube and press E key to extrude and Enter key to confirm the extrusion. Scale it down to 50% by pressing the S key and 0.5.

Move the extruded face down by 2 units (Press G key, then Z key to lock the movement to the Z-axis and then press -2 to move it down).

You created a highly detailed pot!
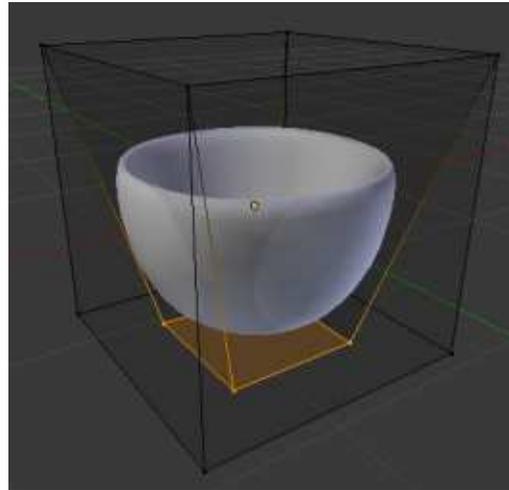
By editing the cube, dynamically you edit the sphere in an organic way. Without the Subsurf you'd need a lot of time and effort to create this pot.

Another critical tool to use with Subsurf is the loop cut.

Tip: Loop Cut or Loop Subdivide (shortcut Ctrl-R) splits a loop of faces by inserting a new edge loop intersecting the chosen edge (source: wiki.blender.org)

Deselect all by pressing the A key, and then press Ctrl-R. Hover your mouse over the cube faces and you will notice a purple line "cutting" the edges as shown to the image below:
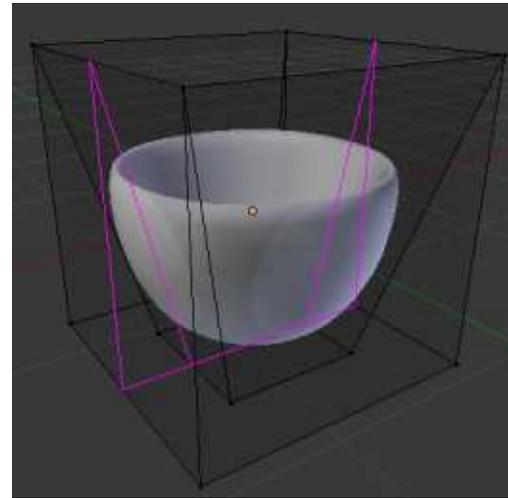
Press 2 or scroll your mouse wheel to add 2 loop cuts. Press enter to confirm.

After that, you have 2 yellow edge loops selected and by moving your mouse you can slide them freely. Press the right mouse button to place them to the center

of your edge (default position).
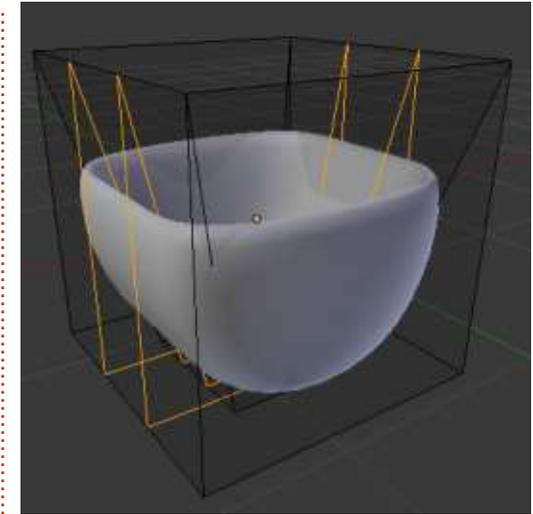
Press A key to deselect everything.

Now, to select one of the two edge loop cuts that we just created, we have to use the shortcut Shift-Alt-Right Mouse Button

Tip: The actual shortcut for Loop Cut Select is Alt-RMB but under linux it conflicts with the functions that are assigned by the system to the alt key.

With the leftmost edge loop selected, press Ctrl-E to open the edge special menu, and select edge slide as shown in the image on the next page.
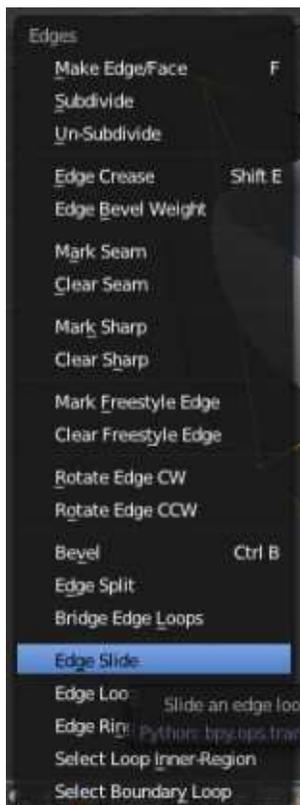
You can slide the edge loop by moving your mouse or by entering directly the value of the movement (for example -0.8). Deselect all by pressing the A key, and select the other edge loop. Slide it by 0.8 units.

Create another two edge loop cuts to the other side of your cube (check image above right)

Select and deselect anything you like. Grab a simple vertex and move it around to see what is happening to your shape. Select two vertices and scale them up or down. While in the edit mode, add a new shape, for example a plane, and see what is going on.
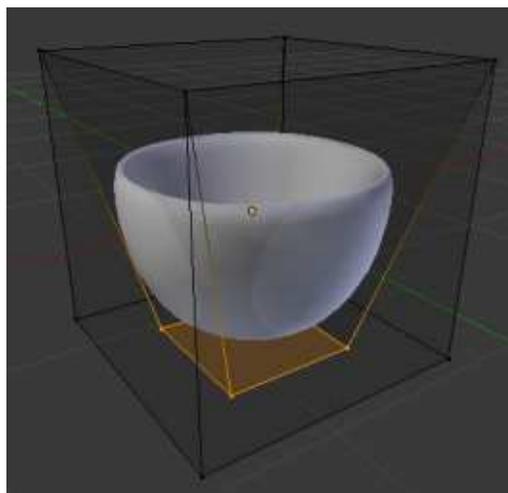
Next month we will continue our journey with Subsurf, and we will try to create something. Please send me your suggestions or questions at blender5d@gmail.com

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LIBREOFFICE SPECIAL EDITIONS:
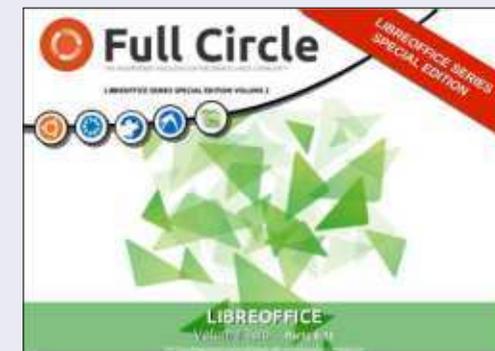
http://fullcirclemagazine.org/libreoffice-special-edition-volume-one/

http://fullcirclemagazine.org/libreoffice-special-edition-volume-two/

INKSCAPE SPECIAL EDITIONS:

http://fullcirclemagazine.org/inkscape-special-edition-volume-one/

http://fullcirclemagazine.org/inkscape-special-edition-volume-two/

Last month, we introduced SubsSurf (Subdivision Surface), a very useful modifier to create smooth, high quality models. You have to practice a lot to get familiar with this tool to reveal its powers. Let's see some examples

CREATE AN EGG

Start a new project in blender and add (if it's not already present) a cube.

With the mouse in the 3d view window, press the tab key to enter edit mode. Press the A key to deselect all vertices and select the four upper vertices.
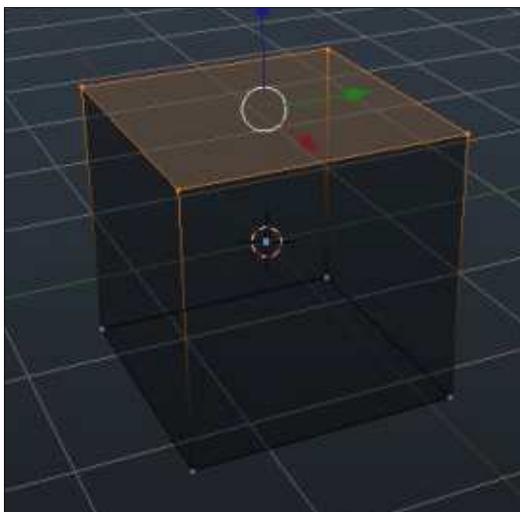

Press the S key and 0.5 to scale down the selected face by 50%. Then press the G key (G for Grab) and 0.1 to move the selected face up. We have something like a Mayan pyramid now. Press the tab key to exit edit mode and return to object mode.
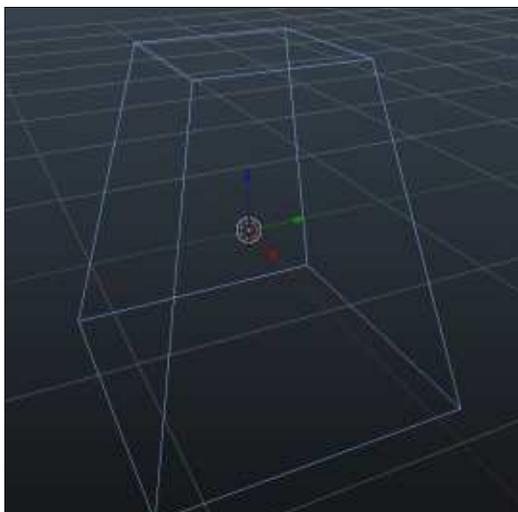
This is the power of Subsurf – from a pyramid we can have an egg! Now go to the properties panel on the right and select the modifiers tab indicated by a wrench to access the subsurf modifier. Add the modifier, and increase the View and Render values to 3. On the left, under the objects tools tab, apply the smooth shader. We got an egg.
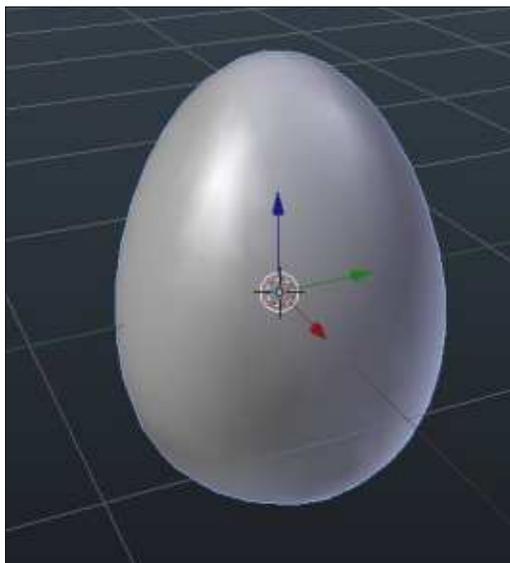
Tip: The "non-destructive way" is something that you can get when you use modifiers. You create an object by using a modifier, but, if you decide not to use the modifier, it's very easy just to delete the modifier or alter it. The actual starting model is there "underneath" your effects. When you hit apply under the modifier's tab, you "destroy" this functionality.

OK. We have seen subsurf in a non-destructive way. Now we can see what mesh we can actually create by applying our modifier to the models.

CREATE A BULLET

To tell you the truth, I'm not a big fan of guns and bullets. But, when you have to model an object, you have to know what it looks like. Thank God we have google and a lot of image banks for that. So, after some clicks, I found a bullet image to work with. (In the next article I'll show you how we use images as a blueprint to model objects).

Let's start a brand new project with a cube in it. On the cube, add a subssurf modifier, and increase View and Render to 3. Press S to scale your cube, Z for the Z axis, and 1.5 for the scaling. Press the tab key for edit mode. Select the four upper vertices and press the E key for extrude. Around 1 will be fine. Press Ctrl-R for an edge loop-cut. You must have something like

the image below.
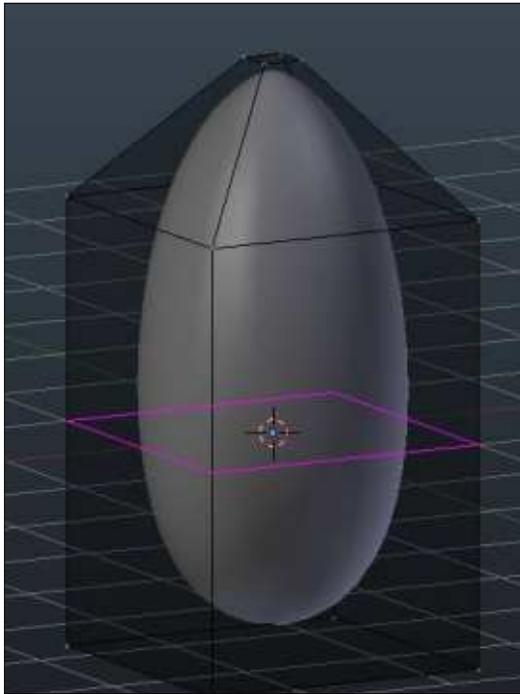
As you press the mouse button to accept the loop-cut, move it down – near the base of your model. Notice that the modified object changes its shape. Switch to object mode to apply the modifier. Now we can accept the modifier by clicking Apply under the modifier's tab.

Go back to edit mode to see what just happened. We have a mesh created by subsurf modifier!

Press Alt-Ctrl-R for edge ring selection.
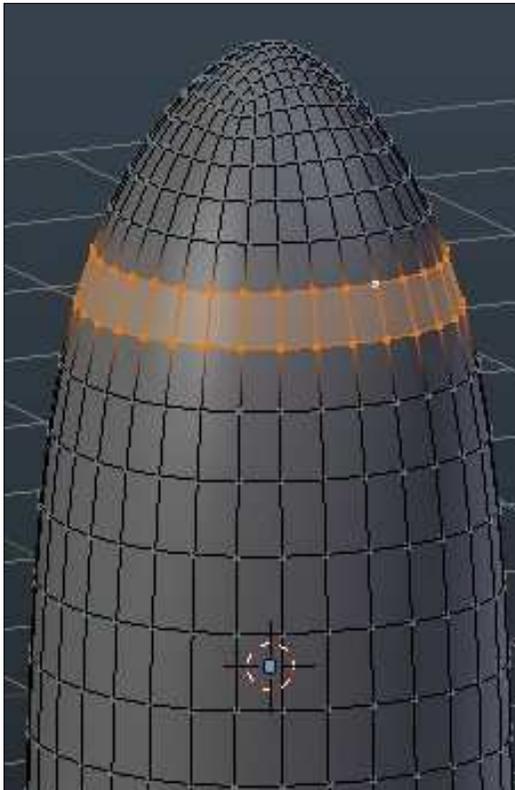
Press E and Enter key to confirm the extrusion. Press S to scale your selection a very little bit. Press G to move your selection down almost

at the center of your bullet. Scale it up a little to create something like the image below.
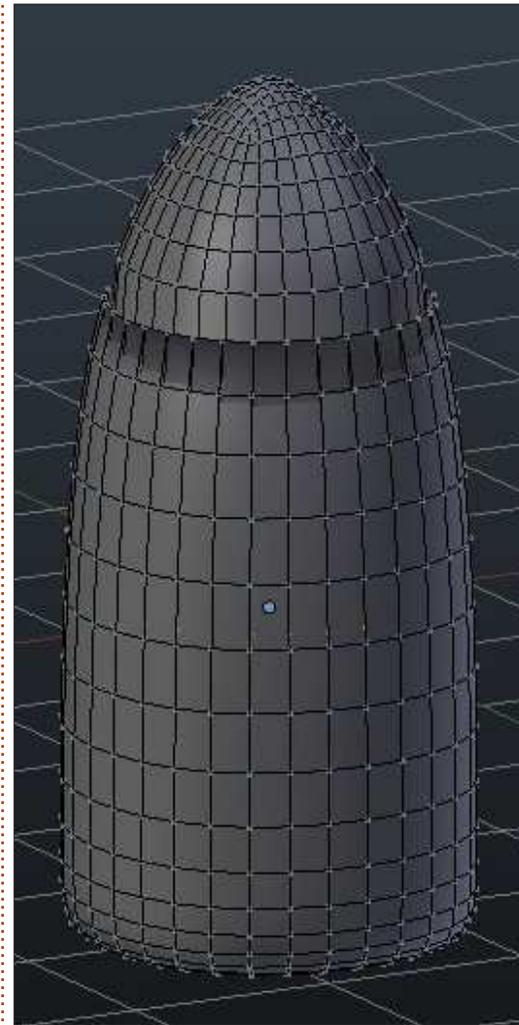
Ok. We have a basic shape of a bullet. Adjust anything you like, start a new project and create a rocket or something using the subsurf modifier. When you are

happy with your modified shape, apply the modifier and continue from there to finish your project. Remember that when you apply a modifier, you have a new mesh and you can re-apply a modifier if you like. In a later stage we can talk about modifiers stuck and how it works.

Next month, we will introduce Bezier curves, and I'll model my favorite team's logo.

For this month, I can suggest blendswap.com community. 3D artists around the world can post their work in blender there and have actual job opportunities!

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As I promised for this month, we will introduce Bezier Curves.

Bezier curves (named by the French engineer Pierre Bezier) are used in computer graphics to set the coordinates for a smooth curve really easily.

Lets see what we are talking about. Start a new project in Blender and get rid of the cube (select the cube, press X to delete and confirm).

Now, press Ctrl-A to add a Curve-->Bezier
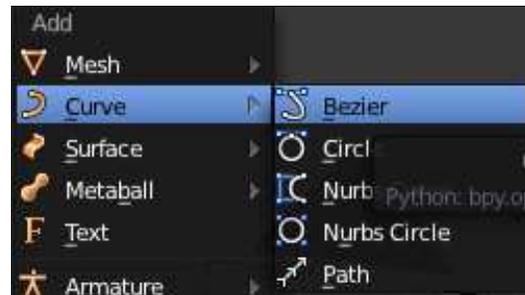
Press R for rotation, X for the X-axis, and 90 for the degrees of the rotation. Then, press Numpad-1 for Front view and Numpad-5 for orthographic view.

You should have something like the image below
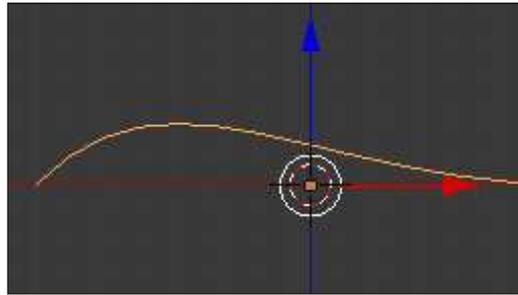
Lets press the Tab key to enter the edit mode. You can see a strange looking shape of something like a fish skeleton or pointing arrows – whatever you prefer to call it ...
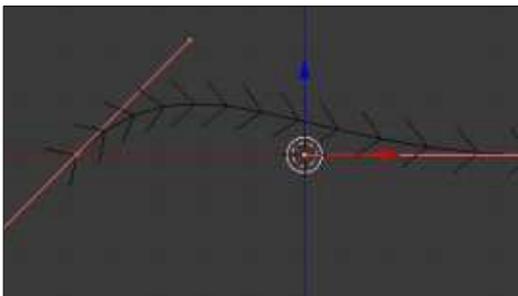
The interesting stuff is the two pink lines representing the edges of the shape (this "shape" is the actual segment of the curve). Let's focus on the right pink line. Press the A-key to deselect everything.

Select the middle vertex (called control point) as shown below:
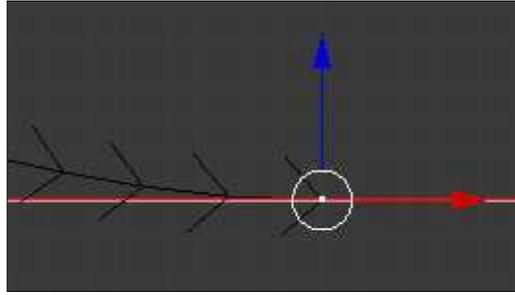
Notice that the other 2 vertices (called handles) are selected as well. Press the G-key to move the control point. Your curve's right edge moves. Press the RMB (right mouse button) to cancel or the LMB (left mouse button) to confirm the movement. Now, select the right-most vertex (handle for now on). Move it as we did earlier with the control point.

The control point stays in place but the handles are moving. Also, the curvature of the curve is changing! Moving the other handler also changes the curve. Moving the handler towards the control point changes the curvature of the curve respectively.

With the right control point selected, press Ctrl+LMB. You create another control point and actually extrude your curve. The newly created control point is the last now, the last one represents where your curve is finished. If you want to extend your curve from the starting edge, select the starting edge and press Ctrl+LMB to add a new control point as the starting edge. If you want to close the curve, select the two edges and press the F-key to add a closing segment. This is all we need in order to create our logo with Bezier curves.

For more details about Bezier Curves go to http://wiki.blender.org/index.php/Doc:2.6/Manual/Modeling/Curves

Our goal is to create a three-dimensional logo from a two-dimensional logo, and we will start from an easy one. My favorite Greek team is Panathinaikos, so let's google to find the team's logo.

I came across this jpg that is just

fine for the work.

I don't really care about the text so if I want to I can crop it using Gimp. It's fine for my purposes, so I'll leave it the way it is. The good thing is that we have to model just a clover. An easy task for bezier curves.

So start a new project, remove the cube, and have a Front Orthographic view on your 3d view window.

One powerful tool is the ability blender gives us to have as a blueprint an image at the background, for easy modeling.

Press N-key to toggle hide/unhide the right side panel (properties panel) at the 3d view window. Leave it unhide, scroll it down, and "tick" the Background Images


Press the Open button and navigate to the location that you downloaded the image. Select and open that image.

The image appears at the background. You can alter some of its properties (the transparency or the position, for example) from the panel that appeared just below the open button that we pressed earlier.

Tip: The background images are visible only at orthographic view and only at precise angle (front, left, top etc). At a later stage, I can

show you techniques to handle images as 3d objects viewable from any angle and any view.

Now, add a Curve-->Bezier. Press Tab-key to go to edit mode and using the Ctrl+LMB to add the necessary control points, create an outline of the clover as shown at the image below. Use the handles in order to create the curves that you need:

After that, we don't need the background image. Untick it at the properties panel or press the X icon just below and to the right of the Add Image button.

Up to now, we have a two-dimensional shape, and we have a little more work to do for the third dimension.
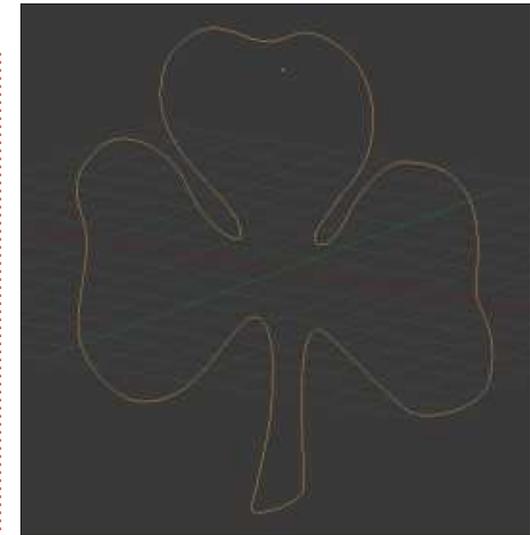
To be continued...

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Last month, we created a clover using Bezier curves and also we used a background image to model it. Now it's time to add the third dimension of our model.

On the right, under the properties window, select the curve tab:

Scroll down and you will find the Geometry panel. Enter the value 0.2 to Extrude as shown in the image below:
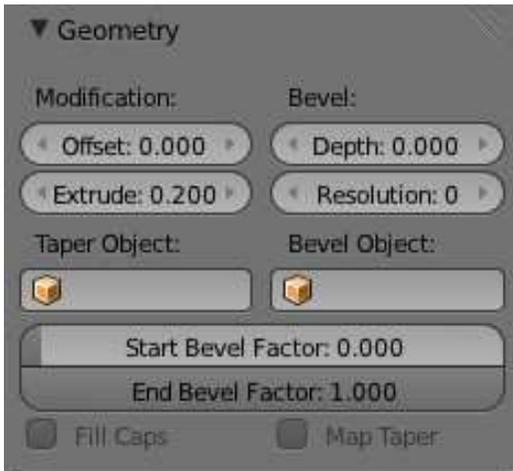
You can check the 3D view window to observe that your image starts to have depth.
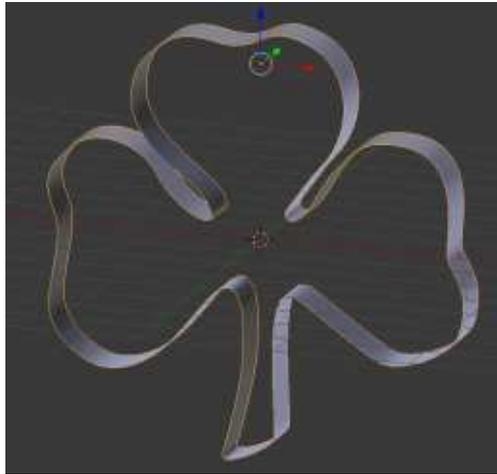

Now, a very interesting thing is under the Shape panel in the properties window:
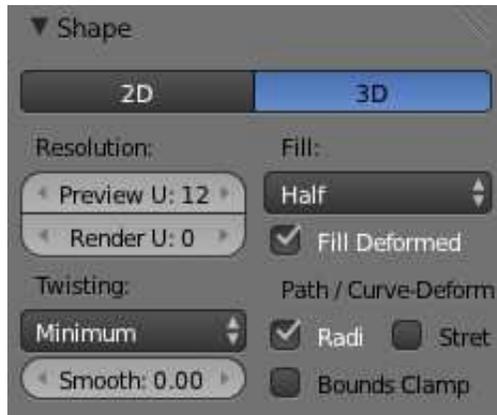
You can see that the 3D button is selected. Press the 2D button. Under Fill, select Back. Your model "filled" in the back. Now select Front. As you may have expected, your model "filled" in front. As you can guess, if you choose None, nothing is "filled". Let's select Both.

Now you have a solid 3D model – as you can see in the 3D view window.
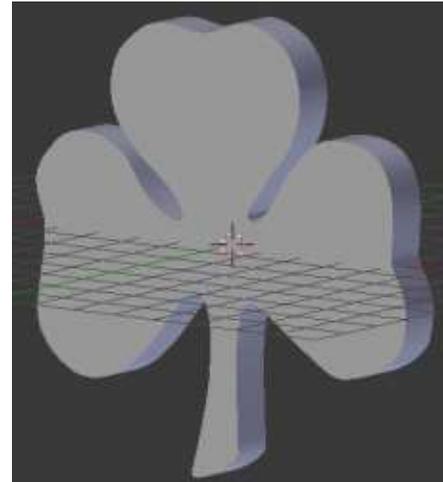
Lets tweak it a little. Under the Geometry panel that we mentioned earlier, you have a Bevel parameter. In Depth, enter the value 0.03, and in Resolution enter 2 as the value. You can alter the Depth parameter if you want to Bevel the edges of your model more or less. For me 0.03 is fine.

Now it is time to add materials to your model. Refer to earlier issues of Full Circle Magazine if you don't remember how to add materials. My favorite material is glass, so I gave a green glass to my clover. Also, add a white plane as a background to have a better visual result.

Next month, we will introduce text. We will add text to our image that we created this month, but also we will examine a technique to create interesting stuff with our model using a very interesting modifier. Stay tuned!

On the 3rd of November, www.blender.org changed its looks. So, I don't have to suggest another site. Explore the new site and have fun!

This month we are going to have some fun with text in Blender. So, start up blender and delete the default cube (select the cube, press X, and confirm the deletion). Now, press the A-key to add a new object in your scene. Add text (see image below)

The first thing that you notice is that, for some reason, blender adds text object facing the top view. I prefer to change that to face the front view so let's rotate our text object 90 degrees on the X-axis (Press R-key, then X-key, and then press 90).

Now, using the num-pad, press 1 for front view and 5 for orthographic view. You must have something like the image below.

Now that we have a better look of our text, let's change it. Press the tab-key to enter the edit mode. Change the default "Text" to "Full Circle Magazine". Exit edit mode by pressing the tab-key again. Great!

But we have a very boring text (although it says "Full Circle Magazine"). With your text object selected, examine the properties window. Select the tab with an F as an icon to reveal some interesting stuff about our object.

First of all, change the name of our object from the default "Text" to "FCM". Then, change the extrude value under Geometry to 0,2. You don't see any difference to your text. But, if you rotate your view (by holding the middle mouse button and moving your mouse, or by pressing 2,4,6 and 8 on the num-pad), you can see that we extrude our text. Great!

Also we can adjust the depth of
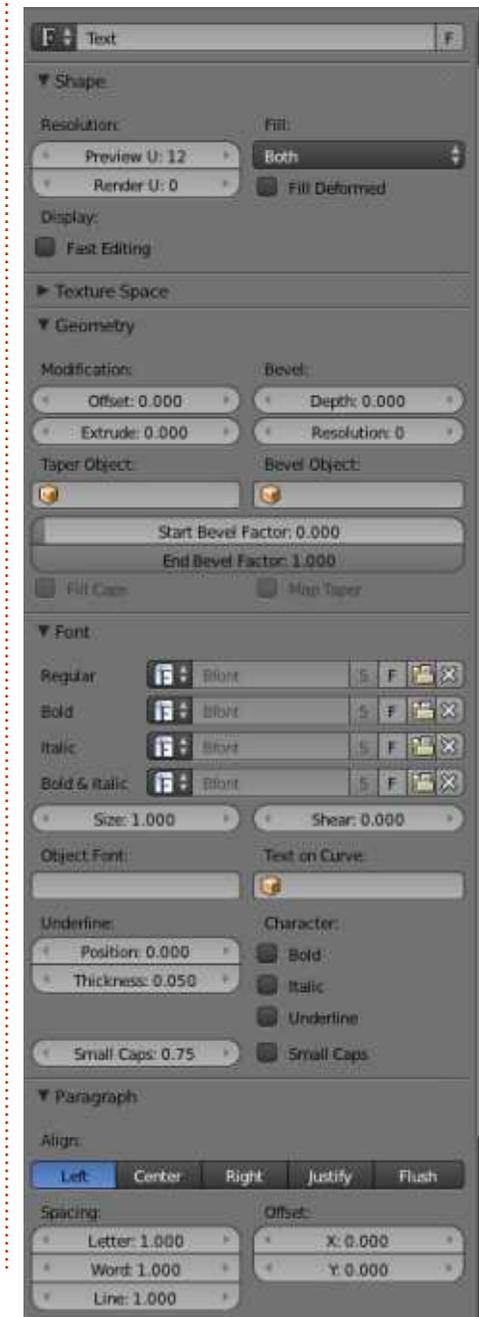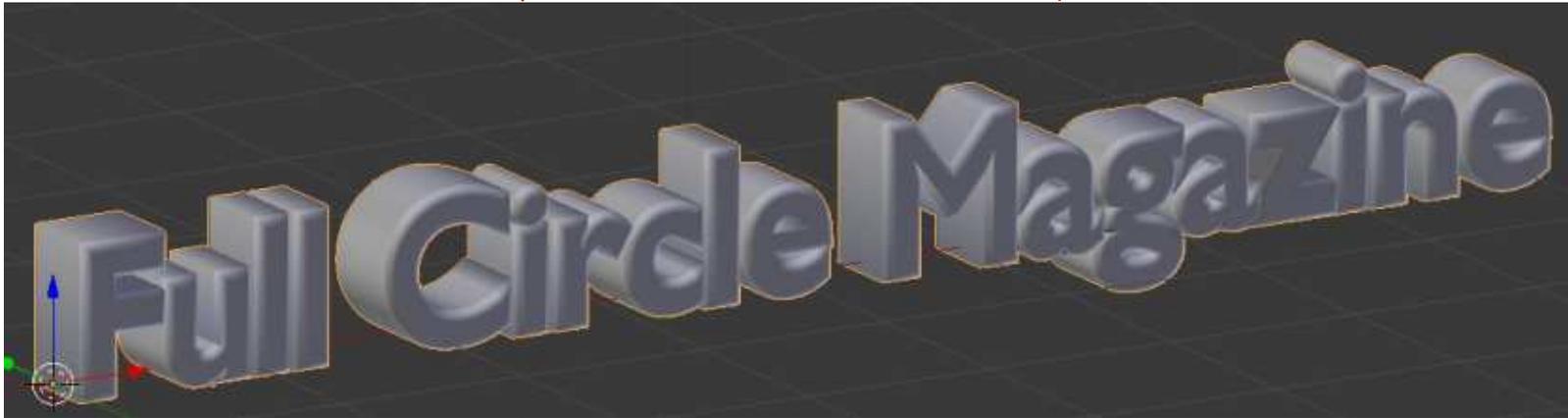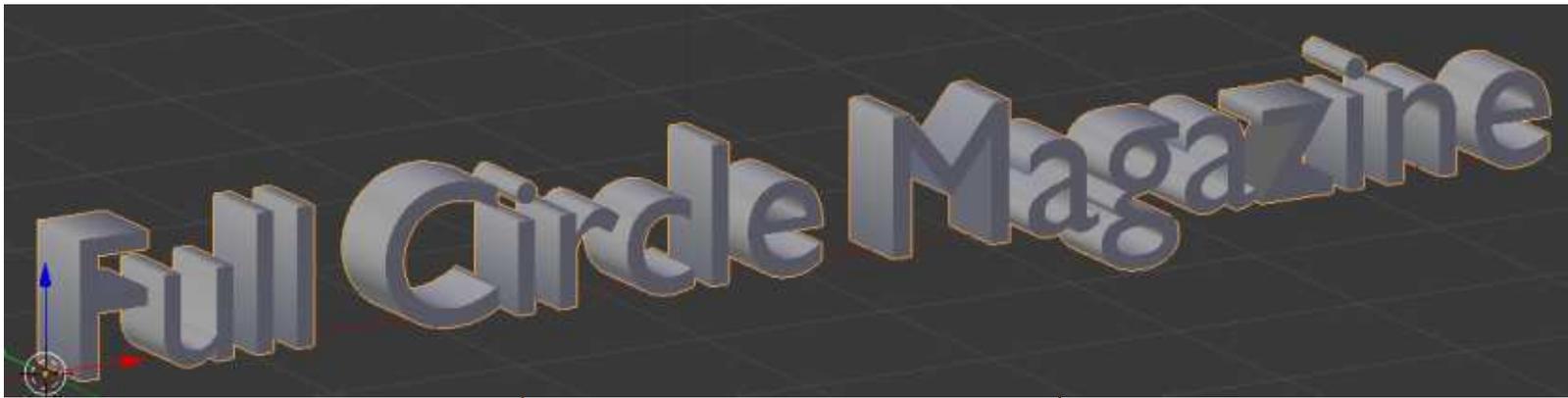
our bevel factor.

Change the value of Depth to 0,05 and the Resolution to 10.

Ok. Now we are going to change the Fonts.

Press the file icon (the icon between F and X), and navigate to your Fonts folder. Select the font of your desire. I choose Isabella (search the repositories for ubuntustudio-font-meta package). The Geometry values that we changed earlier are not suitable for this font. I 'll make extrude = 0,05 and Bevel = 0,02.

Ok, now let's add a box and rotate, scale, move it. Also use textures! It will be easy to create something like the image below.

To be continued...

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Last month we created a text object, and we manipulated it (rotate, scale etc.) Now let's see some other adjustments that blender gives us.

On the right, under the F tab, we have as you remember from last month, all the good stuff to alter our font object. We will stay with the basics for now, although blender giving us many tweaks. So, under Font, we have Size and Shear. You can make your text bigger or smaller by altering the size value, and you can shear your text to the left by giving a negative value to Shear or to the right with positive values.

Also, under Shape, you can change the resolution of your text object or the Fill of your text. Experiment with these and you'll understand them better than I can explain to you.


Now, lets start a new project to examine something else (I will explain later why we have to create a new project for this example). Don't delete the cube, just move it a little and add a new text object by pressing Shift-A !   Text or by the menu under the Add button (you know these things by now!). Rotate the text object to face the front view, and increase the extrude value under the F tab to 0,5. Move your objects (text and cube) until you have something like the image below:
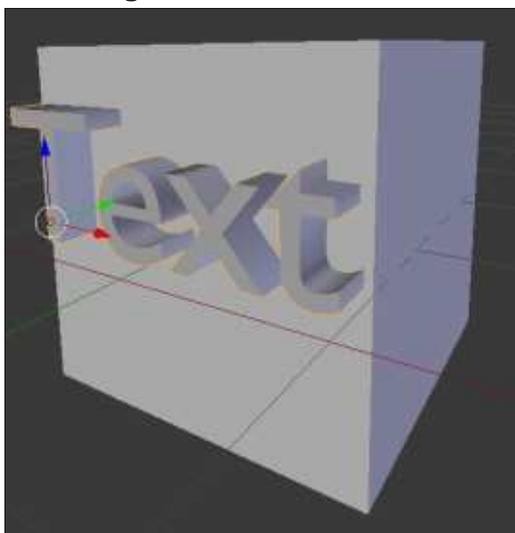

It is critical for our example that the two objects intersect.

Now, it is time for something interesting. With the text object selected, press Alt-C. From the menu that pops-up, select Mesh from Curve/Meta/Surf/Text.


Something very interesting just happened. Blender created a mesh object that you can manipulate just like any other object. Press the tab key to enter edit mode, and see for yourself what I am talking about.
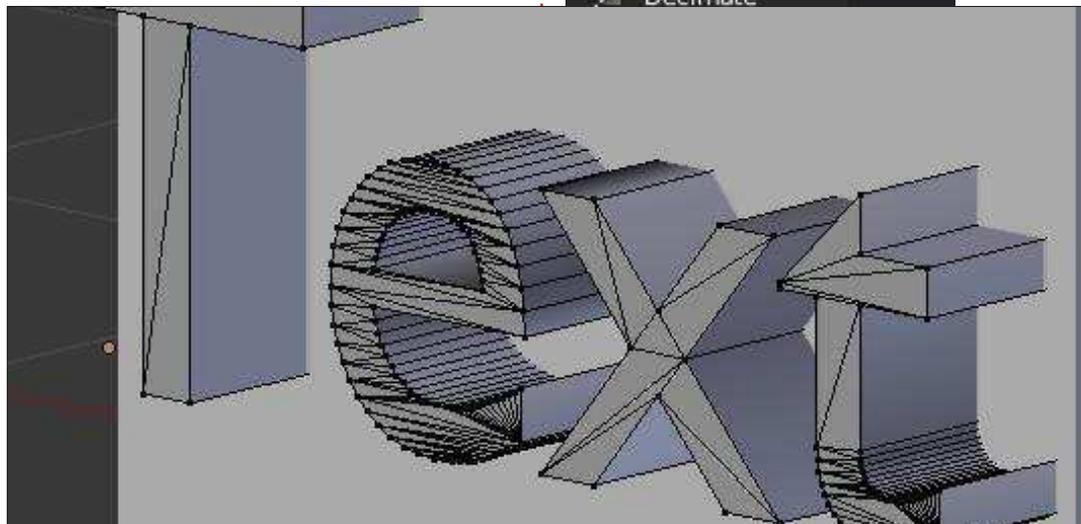
The reason that I converted the text object to a mesh object is to use a modifier that I really like and I want to challenge you to experiment with – the boolean modifier. So, let's select our cube and select the modifier tab.
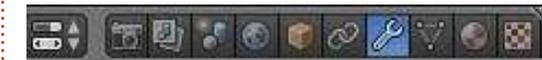
Add a new modifier called Boolean.
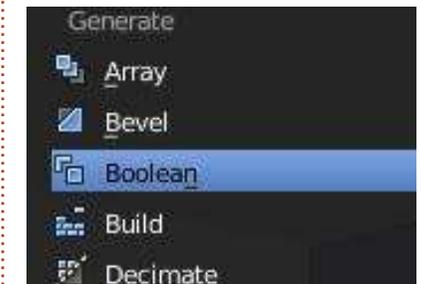
Under the Operation choose Difference, and under Object select your Mesh object that you created from Text (I didn't rename it so it's called "Text"). Then hit Apply.
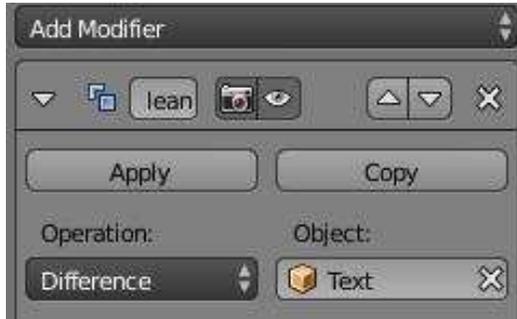
After a while, depending on your machine's power and memory, the boolean operation will be completed. Now, if you move the text or the cube you can see what we created.

Blender has calculated the difference between the two mesh objects and cut-out the object on which we applied the boolean modifier.

If we had tried it with a more complex object, such as the 'Full Circle Magazine' text (with an elegant font and with the curves that we had applied), blender would have crashed. That's why, for our example, we used a much simpler text object. Also, the convert-to-mesh command would have been more demanding for blender to handle.

But, the boolean modifier is very useful and very light – if you have simple objects as cubes or pyramids, for example.

For this month, I would suggest http://gooseberry.blender.org/. It is a new project that the blender institute has just started.

Next month, we will continue with text, but this time we will introduce a little bit of movement called animation. We will try something like the Star Wars introduction: "A long time ago in a galaxy far, far away..."

Enjoy!

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