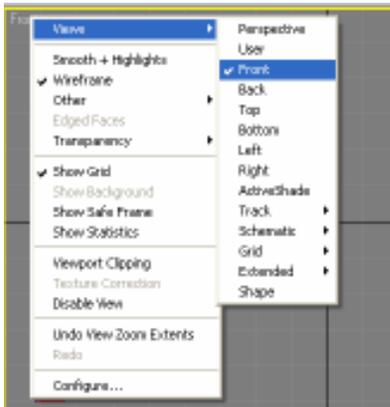# Eye Spy: Modeling a Realistic Eye in 3DS Max 9
A Beginner's Step by Step Tutorial by Cymae

Well, there are one or two tutorials out there on how to model eyes, but none of them are very specific or very good for that matter, so after studying and deliberating, I've decided to make one.
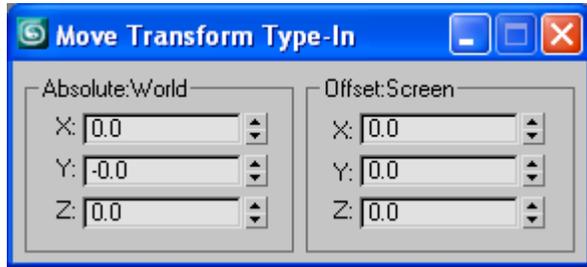
Let's begin.

First, for those of you new to max, let's set up the viewports so you can follow along with the pictures in this tutorial.

Right click the text in the top right hand corner of each viewport (the grey checkered window) and select the appropriate view. The top left viewport should be set as **Top**, the top right as **Front**, the bottom left as **Left** and the bottom right as **Perspective**. Again, this is not necessary but it will help you follow along with the tutorial

First, create a sphere with a **radius of 50** and **32 segments**:
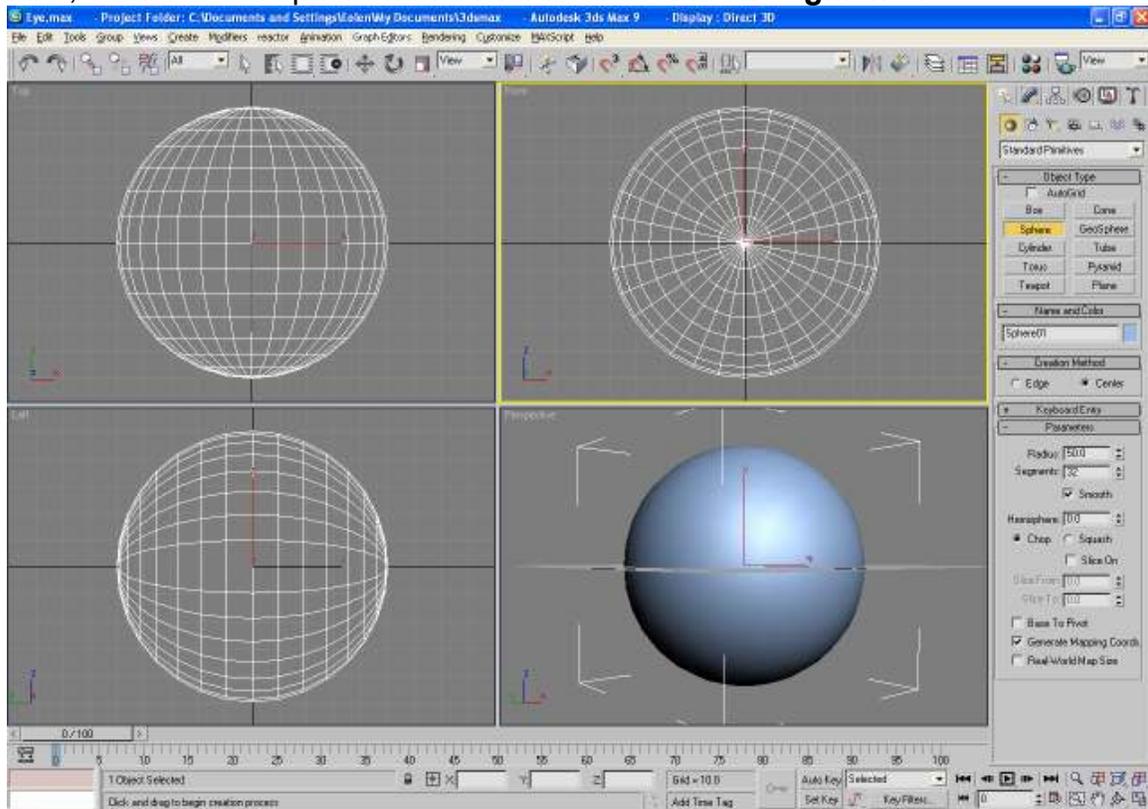
Right click the **select and move** [icon] tool on your tool bar and the following dialog box should come up:

Move Transform Type-In

Absolute:World
X: 0.0
Y: -0.0
Z: 0.0

Offset:Screen
X: 0.0
Y: 0.0
Z: 0.0

Make sure the **Absolute: World** settings are all set to **0**; this should center your eye.

Click the **Zoom extends all** [icon] button to center all the viewports on your eye. You should get something that looks like this:
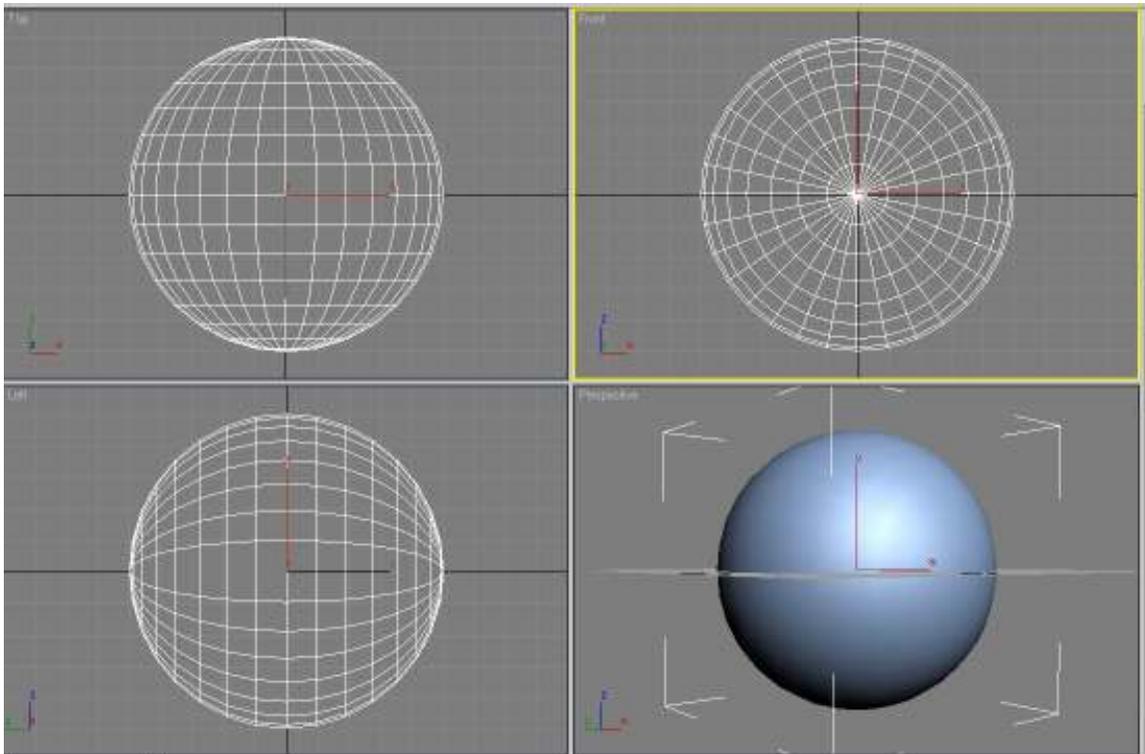
The first thing we are going to do is select our sphere by clicking on it in any viewport with the **select** tool activated and add an **edit mesh** modifier from the **modifier panel**.

This allows us to edit the individual pieces of the sphere and shape our eye. We are going to call this object **Eye White** and you can change it by editing the text of the selected object in the modifier panel (where it says Sphere01 in the image to the left).

Now click the plus button next to the **Edit Mesh** modifier and select face. You will notice it turns from grey to yellow, this means it is active.
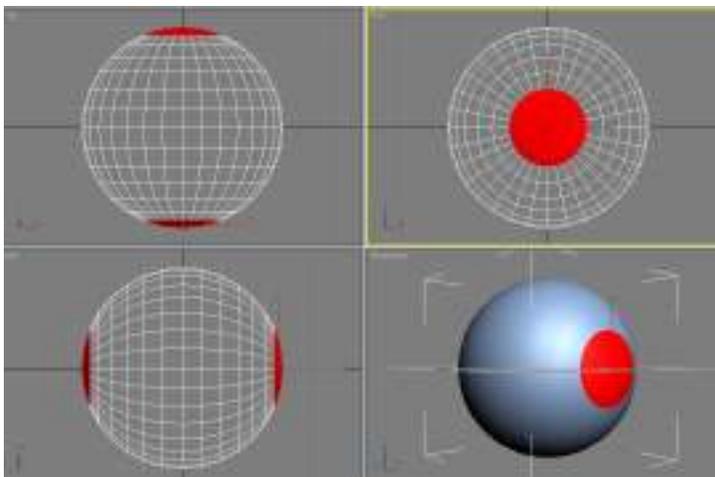
Now click the **Rectangular selection region** tool and drag down without letting go of the mouse button. Select the **Circular selection region** tool. This lets us make round selections, which is perfect because we have a round object. Click the **select** tool and click and drag from the center of the sphere in the **front viewport** and select the area in the first and second ring around the middle of your sphere. Note: it doesn't matter whether you select the area fully to the rim, as the selection tool will take all the polygons within the first and second rings.

Right click anywhere in the top viewport to activate it without deselecting anything, then **deselect** the top red highlighted area by holding down **alt** on your keyboard while you **click and drag**.

The reason we need to do this is because while we were selecting the area we wanted in the front of the sphere, the back area was automatically also selected for us. We only want our eye to have a single front so we deselect the back area.
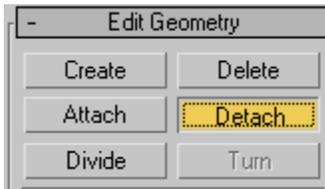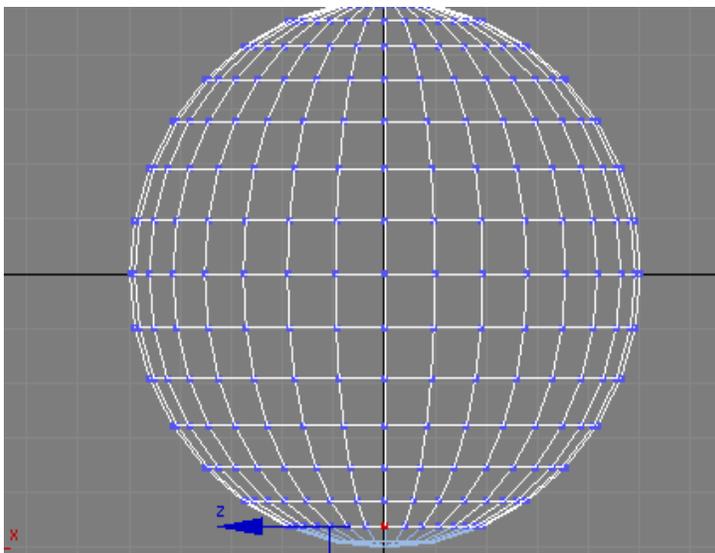
When you have just the front area selected, scroll down the **modifier panel** to the **edit geometry** rollout and click the **detach** button.
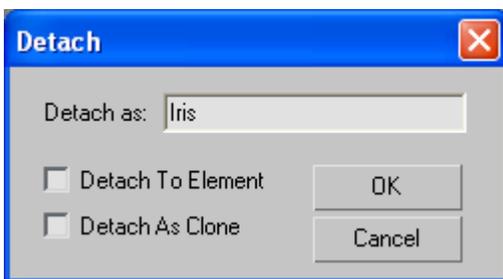
A dialog box will come up asking you what you would like to call your newly detached object. Let's call it **Iris**.
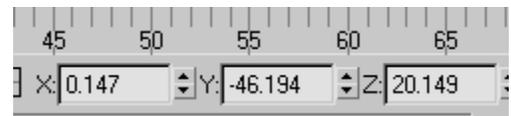
Make sure the **Detach To Element** checkbox and the **Detach As Clone** checkbox are unselected and click okay.

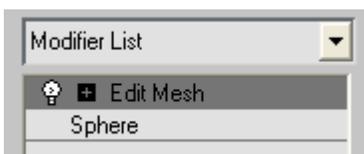Click **vertex** on the edit mesh rollout, and with the **select and move** tool clicked, select a point touching the edge of the section we just detached:
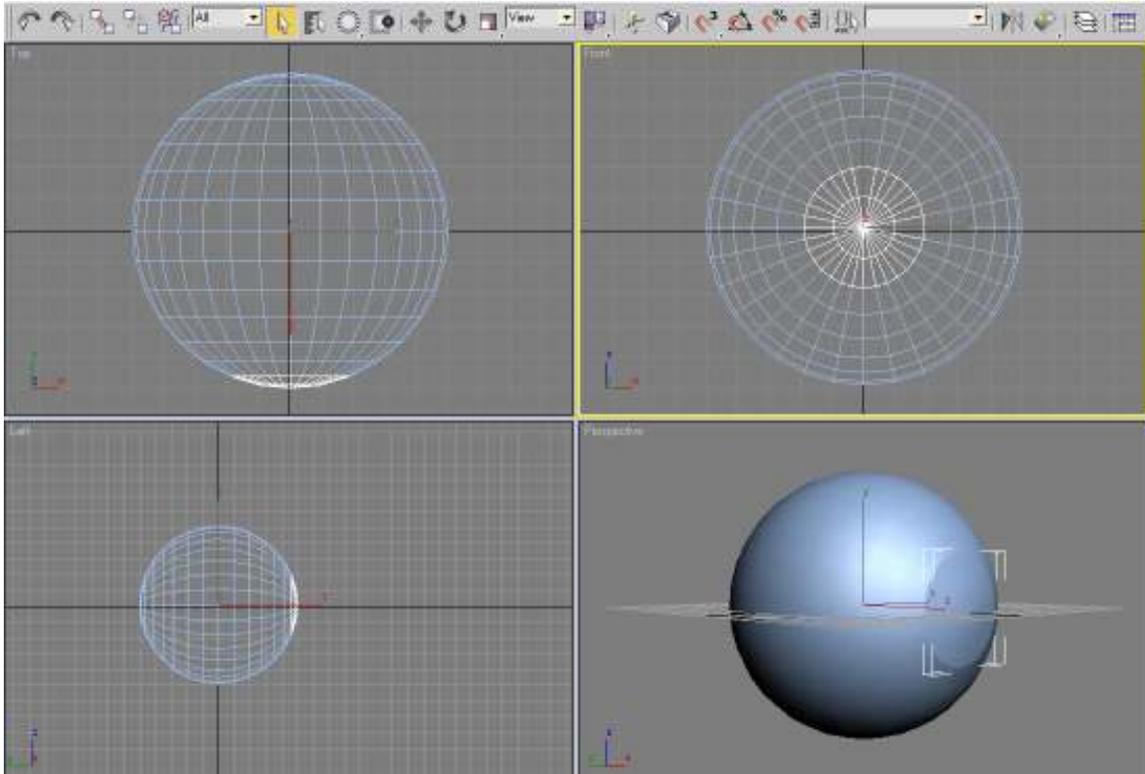
Down the bottom of the screen you will see x y and z values for this point. The value of Y is **-46.194**

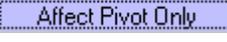Remember this number; it's going to be important later.

Next, Click on the yellow edit mesh modifier in your stack to deselect it (make sure it turns grey), then

click the **select** tool again and select the new mesh which we just made.

Ok, this next bit is tricky, so follow along carefully. What we're going to do is alter the pivot point of this mesh.

As you can see, the transform gizmo (the little line thing with xyz on it) is still in the center of the eye. We don't want that because we want to keep the position our iris is in now and just flip it around so that it's concave, so we're going to alter the pivot point to where we want it.

Click the **Heirarchy** panel and with the **pivot** button selected in yellow scroll down and click the **Affect Pivot Only** button which will turn blue. You will notice some chunky arrows appearing in the center of your sphere where your transform gizmo was. This is your pivot gizmo:
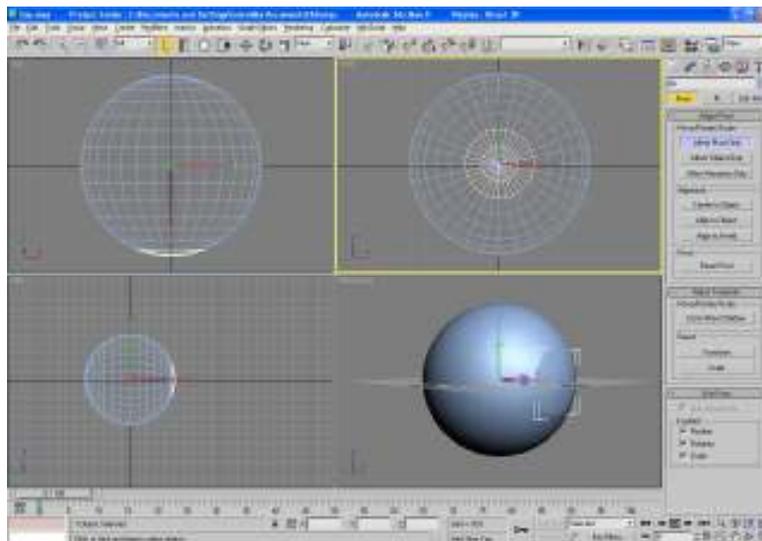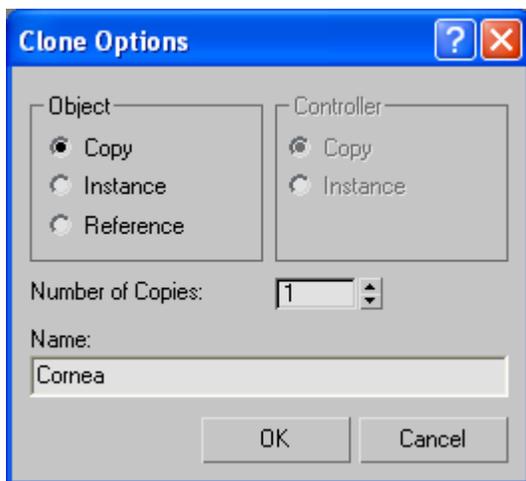
Remember that Y value we wrote down before? Well now's when we're going to use it. Making sure affect Pivot only is selected, type **-46.194** in the text box at

`] X: 0.147  Y: -0.0  Z: 1.015`

the bottom of the screen where it says **Y value** is -0.0
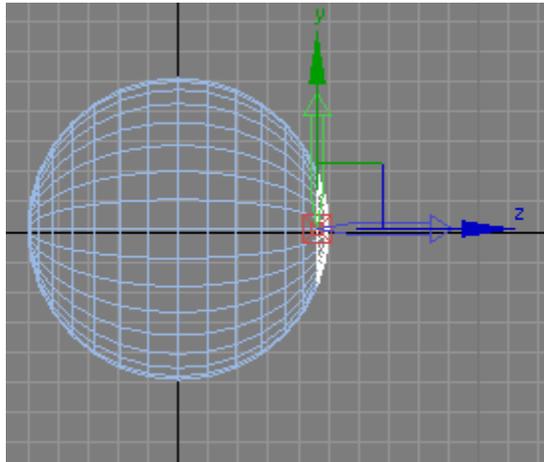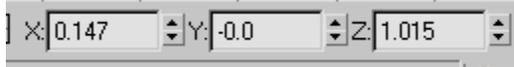
The pivot point should now line up perfectly with the edge of your Iris.

The reason we do this is so that we can rotate it and make it concave without having to reposition the object, as it is now sitting exactly where we want the join in the eye to be.

Click the **pivot** `Pivot` button again to deselect it. The chunky arrows should disappear.

Clone Options

Object
- ● Copy
- ○ Instance
- ○ Reference

Controller
- ● Copy
- ○ Instance

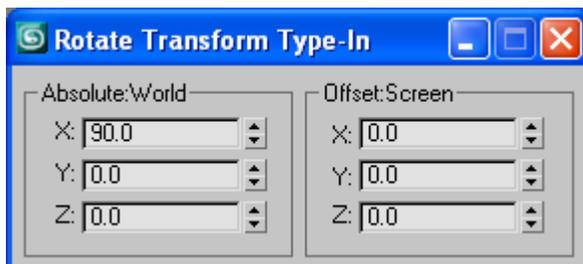Number of Copies: `1`

Name: `Cornea`

OK   Cancel

Click the **select and move** tool and in any viewport, hold down **shift** and click the transform gizmo. Be careful not to move it as you're clicking (so don't click and drag!). Another dialog box should appear asking you how you would like to clone your object.

Call it **Cornea** (as that's what it's going to be, and make sure all your settings match the one in the picture to the left (they should be default anyway), then **click ok!**

Hide Unselected
Hide Selection
Save Scene State...
Manage Scene States...
display
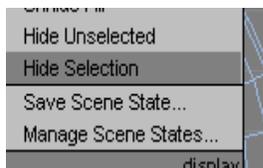
Now, right click it in any view port and click hide selection. We don't need this yet so we're going to hide it for now.

Rotate Transform Type-In

Absolute:World
- X: `90.0`
- Y: `0.0`
- Z: `0.0`

Offset:Screen
- X: `0.0`
- Y: `0.0`
- Z: `0.0`

Reselect the iris and right click the **Select and Rotate** tool and a dialog box should pop up. Set the **X value** of the **Absolute: World** area to **-90**. This will rotate the object around 180 degrees.

Click the **Modify** panel again. If it's

not already expanded, click the plus button next to the **Edit Mesh** modifier and select face. You will notice once again that it turns from grey to yellow (meaning it's active).
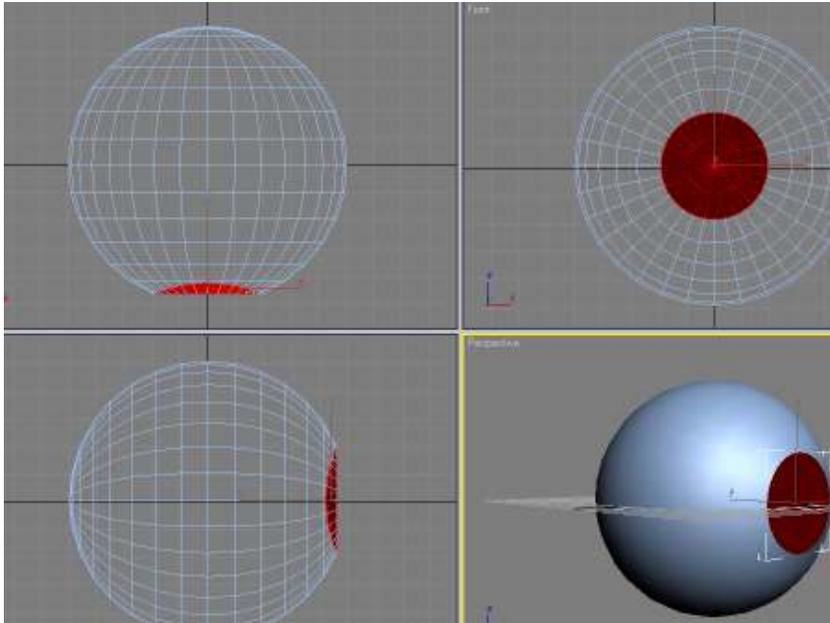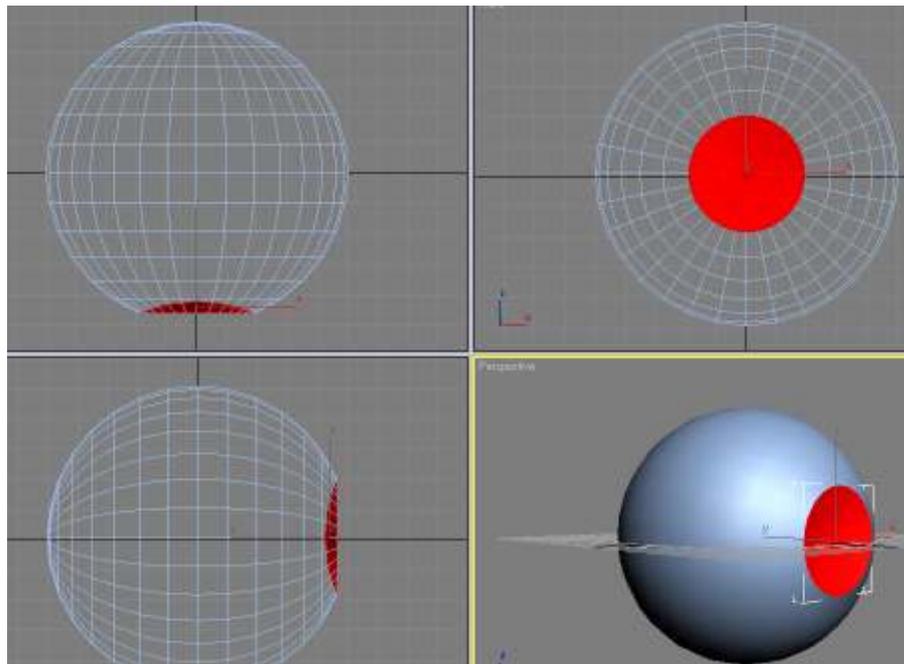

Hold down **ctrl** and **a** on your keyboard. Your entire iris should be red.
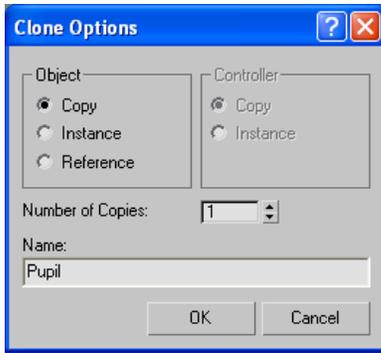
Scroll down the modifier panel until you find the **Surface Properties** rollout. Under **Normals**, click the **Flip** button.

Your iris is now bright red, which means the faces have been inverted (so the inside is now outside etc), which means your iris looks blue when you deselect it instead of black.

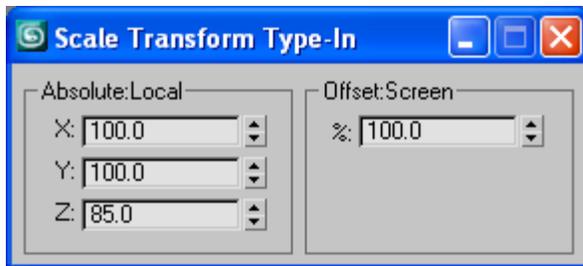Click the yellow **Edit Mesh** modifier again to deactivate it.

With the iris still selected, Click the **select and move** tool and in any viewport, hold down **shift** and click the transform gizmo to create a copy of it. Again, be careful not to move it as you're clicking (so don't click and drag!). The **clone options** dialog box pops up. Name your new object **Pupil** and click **OK**.
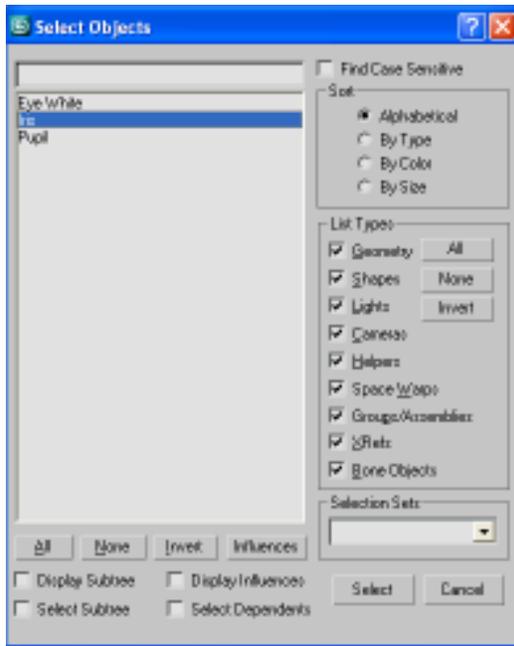
Now, we want to reselect the iris, but the pupil and the iris are sitting right on top of each other, so instead of clicking blindly, we are going to click the **Select by Name** tool in the toolbox. This is a great example of why it's good to name your objects as you go, because then you know exactly what's what. A dialog box appears with a list of all the visible objects in your scene. Click **Iris** and click **Select**.

Now our iris is selected, so we're going to click the **Select and Uniform Scale** tool along the top toolbar and a dialog box should pop up.

Set the Absolute: Local **Z value** to **85** and close the window. You will notice the iris is now slightly flatter than the pupil.
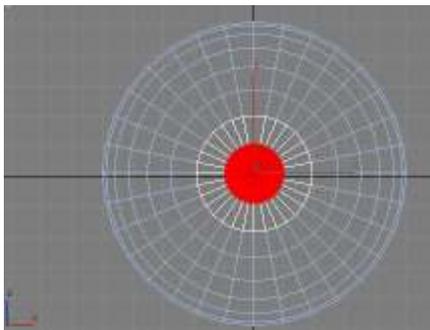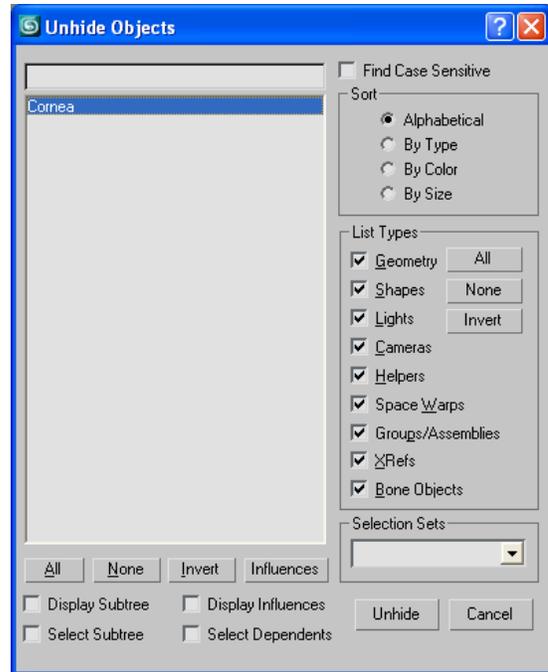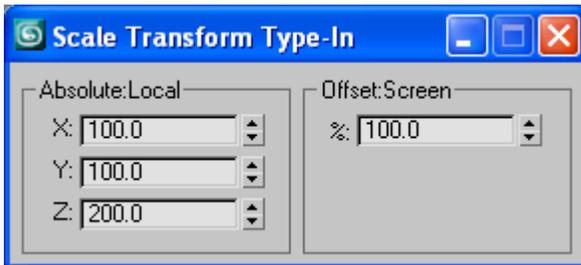
Click Faces in the Edit mesh modifier again to turn it yellow, and select only the inner ring of the iris. Click the **delete** button on your keyboard to get rid of the faces. Now you have a hole where you can see the pupil through. **Deactivate** the Edit mesh modifier.

It's time to play with the cornea which we've abandoned since last time.
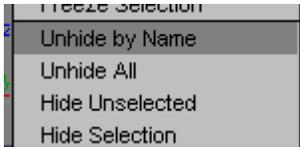
Right click an empty area in any viewport and click unhide by name. A dialog box should pop up. Select **Cornea** and click **Unhide**.

With the **Cornea** selected, right click the **Select and Uniform Scale** tool along the top toolbar and in the dialog box, increase the **Z value** to **200.0**

Unhide Objects

Cornea

☐ Find Case Sensitive

Sort
● Alphabetical
○ By Type
○ By Color
○ By Size

List Types
☑ Geometry   All
☑ Shapes   None
☑ Lights   Invert
☑ Cameras
☑ Helpers
☑ Space Warps
☑ Groups/Assemblies
☑ XRefs
☑ Bone Objects

Selection Sets

All   None   Invert   Influences

☐ Display Subtree   ☐ Display Influences   Unhide   Cancel
☐ Select Subtree   ☐ Select Dependents

Scale Transform Type-In

Absolute:Local
X: 100.0
Y: 100.0
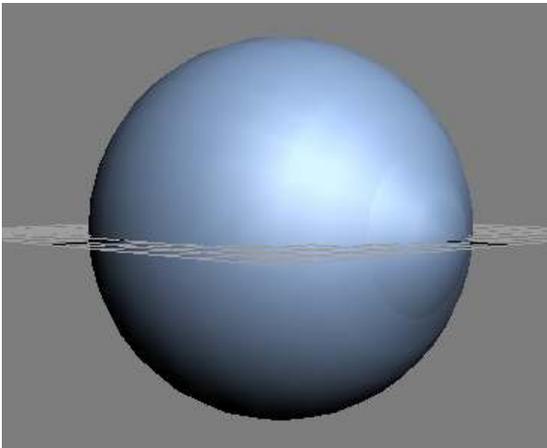Z: 200.0

Offset:Screen
%: 100.0

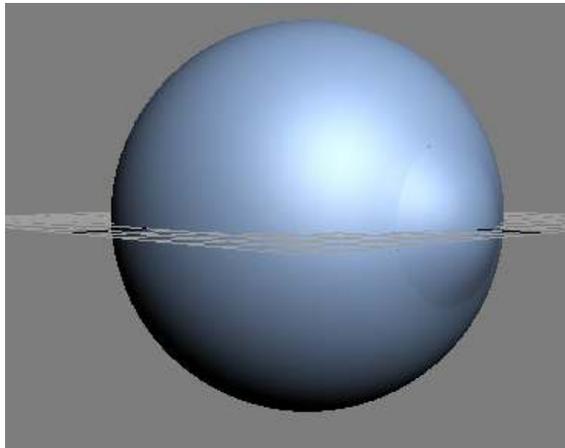You will notice the Cornea now bulges out a little like a regular eye does.

Nearly Done!

Now hold down **Ctrl** and hit **a** on your keyboard. This will select everything in your scene. Go to the modifier panel and in the drop down list, click Mesh Smooth. This smoothes out your whole mesh.

Before Mesh Smooth: **After Mesh Smooth:**

Well, guess what. We're done! It still doesn't look like an eye without some textures though, So I'll give you a very rough lo-down.

Rough lo-down on texturing:

Open up your **material editor** by hitting **m** on your keyboard.

Click the first sphere and change **opacity** to **20**, **specular level** to **50**, and **glossiness** to **30**. Leave everything else as is, and name it Cornea.

Click the second sphere, and change the **diffuse color** to some sort of blue and call it **Iris**.

Click the third sphere, change the **diffuse color** to black and call it **Pupil**

Click the fourth sphere, change the **diffuse color** to a very pale yellowy-white, change the **specular level** to **50**, the **glossiness** to **30**, and name it **Eye White**
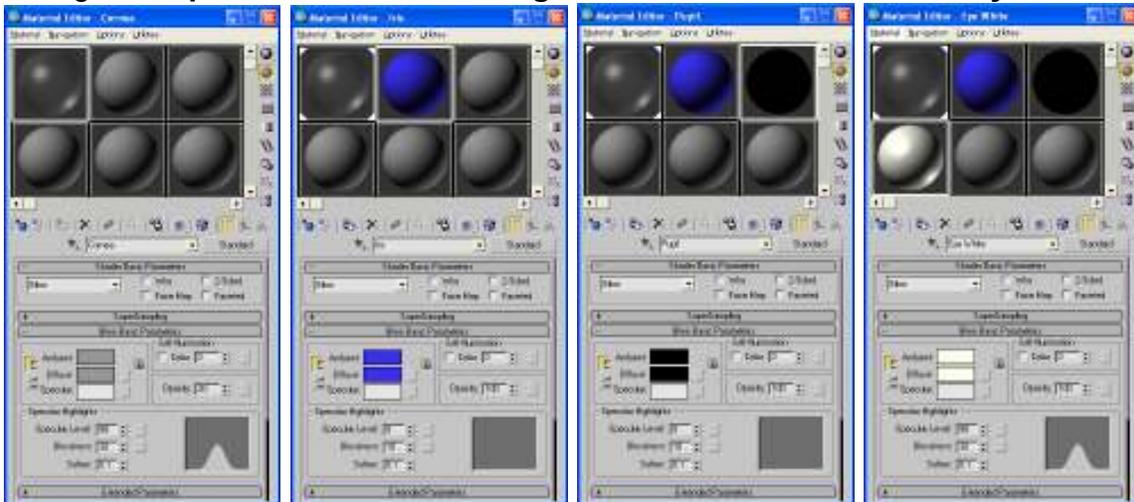
Select the corresponding pieces of eye one at a time and **apply** the materials by hitting the **Assign Material to Selection** button.

Then, hit the **Render** button on the toolbar, and see how it looks!
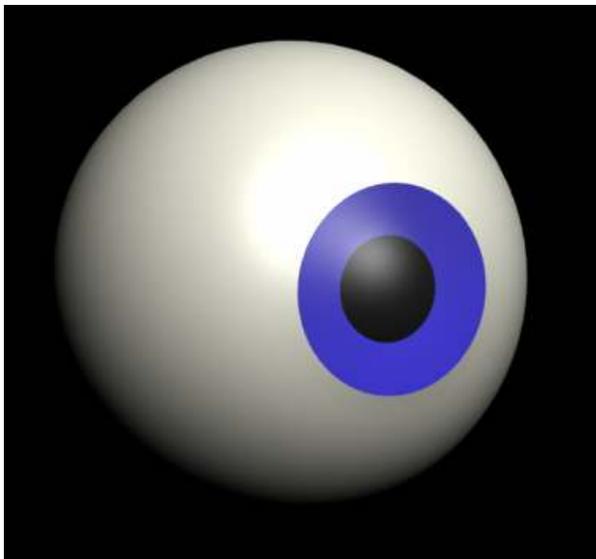
Play around with it until you're happy and see what kind of cool renders you can make!

- Tutorial by Cymae
(eolen-whiteifst@hotmail.com)