

# Blender + Zbrush

## Character Creation Series

Part One: Base Mesh Creation



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# Part One Base Mesh Creation

## Forward

This tutorial series will cover a wide variety of topics. By the end of it you should be able to create a fantasy character that will be fully textured, animation ready, and built with proper topology. We will get in depth with some topics, and breeze right through others. All details are important, but some take priority in this case. The series is aimed at an intermediate level 3D modeler. You should already be fairly comfortable with how your 3D modeling package works.

We're going to be using a specific work flow for this series. That doesn't mean you can't modify this at all, but it will give you a good idea of an approach you can use to character creation. The software used in this series is Blender 3D and Pixologic's Zbrush.

Are they required? No. You can use other programs with similar capabilities, but the series will be tailored to these particular programs. The same end result can be achieved with another modeling and sculpting package, but it will be up to you to apply the techniques and ideas here to another software package.

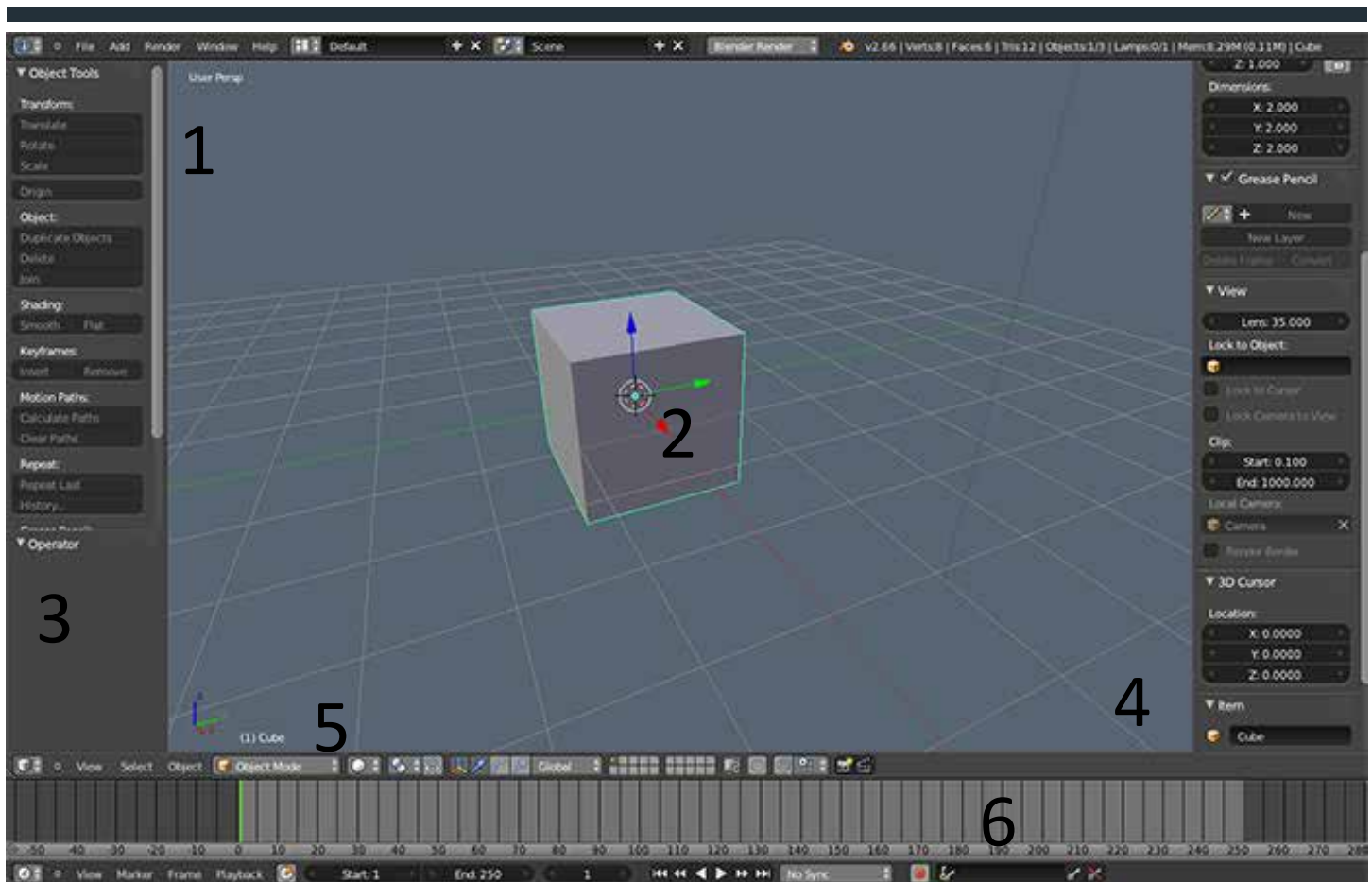
The great thing about this series is that it gives you a broad over view of the entire creation process. If you are a bit more advanced you can skip to another section entirely and follow along just fine. This series, while creating a specific imaginary character can, and should be applied to your own creative projects. What this means is, you don't have to create the character presented here, you can create whatever you want by applying the knowledge you gain from this series.



# This series is broken down into seven parts.

- **Base Mesh Creation:** This section will mainly focus on Blender and the base mesh creation process. This tutorial will force the user to learn the basic functions of Blender, and will also discuss a lot of terminology associated with the art form (example: Base Mesh, topology, etc) This part of the process will also discuss exporting models from Blender, as it is vital to the work flow.
- **Zbrush Importing and Sculpting:** The second section will discuss taking the base mesh created in part one and importing it into the Zbrush sculpting software. This tutorial will help the user learn the basic sculpting functions of Zbrush, along with some Zbrush terminology.
- **Texturing:** The third section will take you deeper into Zbrush, and you will learn how to texture your creature. The creature will also be UV unwrapped in Zbrush. This process will take you through the entire process of creating all the textures you need to make a realistic creature, and export them.
- **Setting up in Cycles:** This part of the series will take you through taking the model back into Blender, assigning the textures, and making sure it works correctly in Cycles Render.
- **Rigging in Blender:** This part of the series will discuss setting the character up with a basic rig (to enable animation.) The rig will be fairly simplistic, as rigging could have an entire tutorial series of it's own. A simplistic view will give the viewer a basic idea of how rigging works.
- **Animating:** In this part of the series we will create a basic animation for the creature. This tutorial will go over how to do basic actions, such as setting key frames in Blender. It will also let you render a basic animation.
- **Finishing the Scene:** In this final tutorial we will have the model posed, and positioned, and place a basic lighting set up to the area, just to improve the look of the model for a final render. The final render will be a still image (but the same principles apply to animation). I will also discuss some basic uses of the Blender Compositing editor in this tutorial as well.

# The Interface Overview



1. The View port: This is 3D space where all models are contained and work is done.

2. Selected Model: This is the current model in the viewport.

3. Left Tool Pallet: Toggle by pressing “T.” Object tools are available here.

4. Right Tool Pallet: toggle by pressing “N.” View port tools are available here, including background image options.

5. Menu Tool bar: Several options including the view port mode, view mode, layers, and 3D widget are contained here.

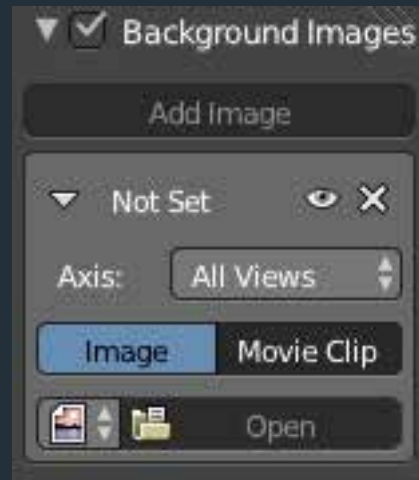
6. Time line: Used for keying frames and timing animation.

# Getting Started

When creating a base mesh for a human figure it is important to have anatomical references for what you are creating. You can use sketches, photos, or find images on Google. You should at least have a front view and side view for proper reference.

To load a reference in Blender:

- 1. Position your mouse over the view port**
- 2. Press “n” so the transform pallet pops up on the ride side.**
- 3. Check “Background Images”**
- 4. Click “Load Image.” You can browse and select your image here. You can also select which views the image will display in.**

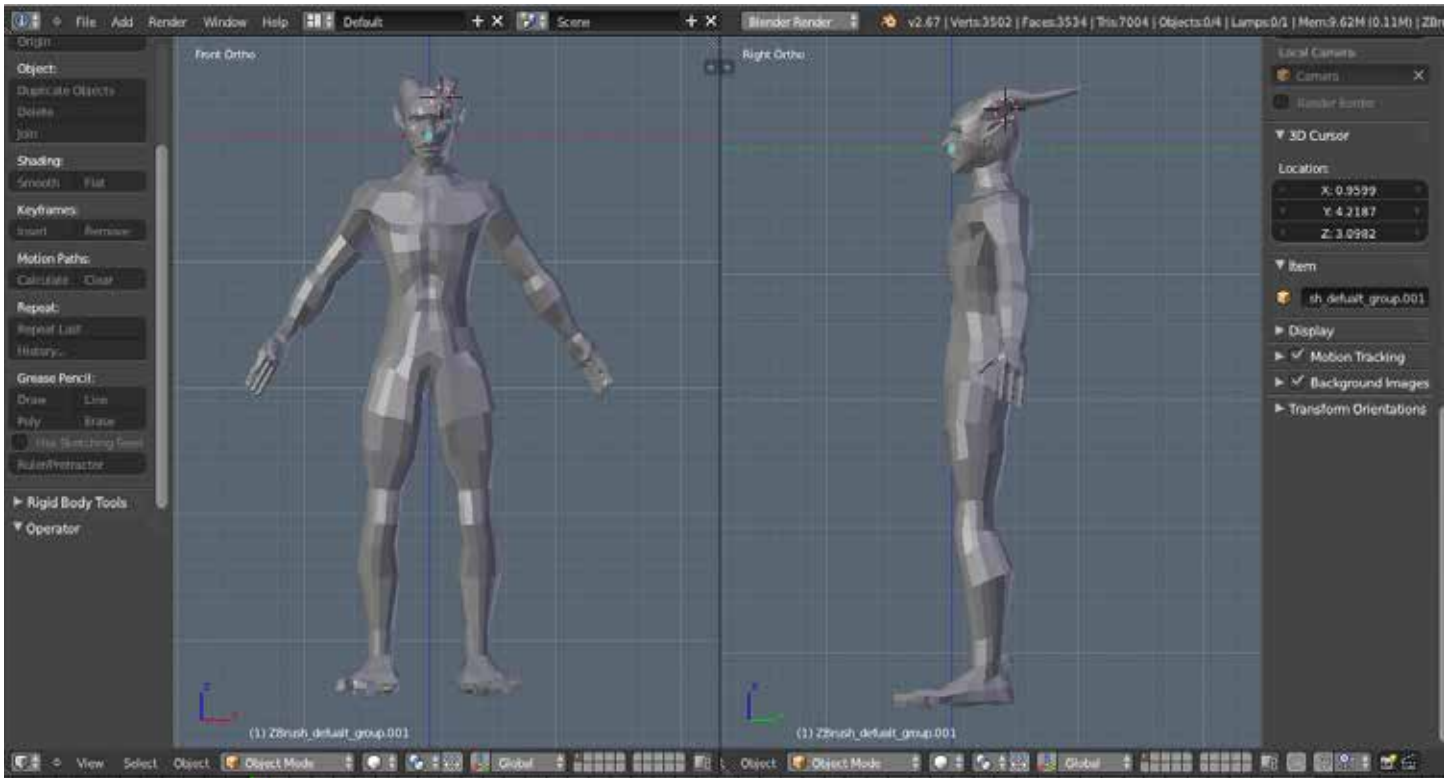


NOTE: Images only appear in orthographic view in Blender. You can toggle Orthographic and Perspective views by pressing “5” on the numpad. You can switch views using the follow camera controls:

- 7 - Top View
- 3 - Right Side View
- 1 - Front View

Holding CTRL plus the number will go to the opposite view (for example CTRL + 3 will go to the left side of the model)

# Splitting The Screen



Another important thing when modeling is splitting the screen. You're going to want to view different sides of the model at the same time when building your mesh.

If you position your mouse between the time line and view port and right click, a menu will come up, allowing you to split the screen.

You can also split the middle of the view port horizontally. It is also possible to collapse a split view in this same manner.



# Adding Basic Geometry



Add Menu in Blender 3D (SHIFT + A)

Now that you have your screen split and reference images loaded it's time to start building the base mesh. The base mesh is the initial model that you will build off of. You're going to start with a plane and follow the reference image.

- 1. Press Shift + A, the menu to the right will pop up.**
- 2. Scroll over "Mesh" and click "Plane."**

To make life easier we're only going to model half of the model. We will mirror the model along the X-Axis so it will be symmetrical



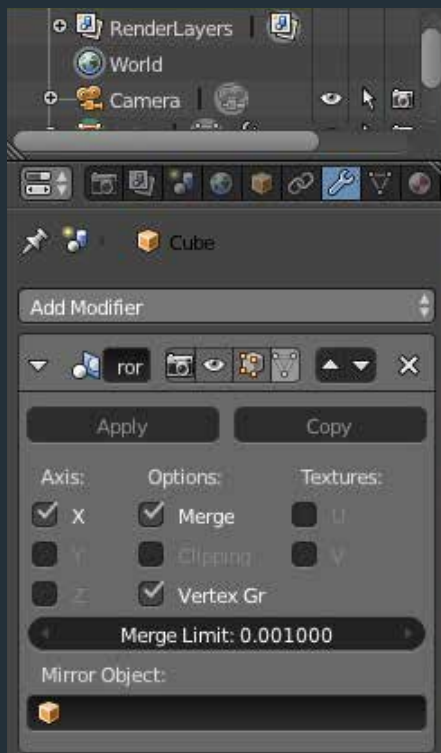
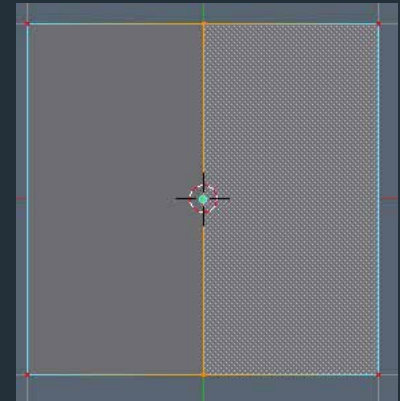
Base Mesh model mirrored on the x-axis, so it appears symmetrical.

# Mirror Modifier

Blender has a wide variety of modifiers. Modifiers are things that modify a mesh, such as mirroring. We are going to mirror the plane you added in the previous steps so the model will be symmetrical.

1. Highlight the mesh, press CTRL+R to create a loop cut in the center of the plane, as shown in the picture to the right.

2. Delete the left half of the plane.



3. On the far right click the “Object Modifiers” button

4. Click “Add Modifier”

5. Under “Generate” click mirror.

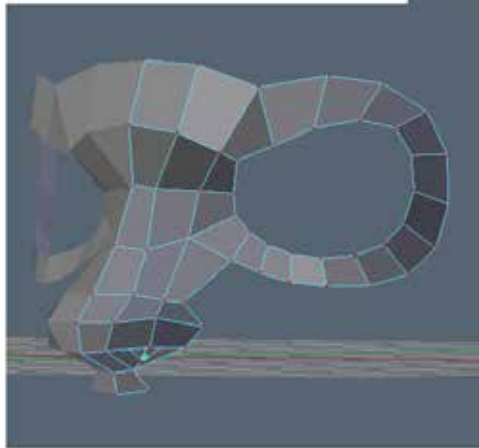
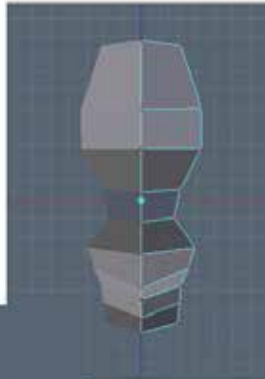
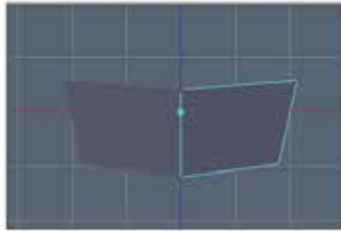
6. The object should mirror along the X axis. Options are present for the Y and Z axis, but we don’t need to mirror them for this model.

Two options to note are the Merge and Clipping check boxes.

Merge will “merge” vertices in the middle, so they will be joined together connecting the two halves.

Clipping will stop a model from passing through the middle to the other side.

# Continuing the Creation Process



**TIP: Quickly create vertices, edges, and faces**

1. Highlight a vertex with Right Click.
2. Ctrl + Left Click anywhere to position another vertex, that forms an edge.
3. Highlight 4 vertices and press “F” to create a Face.
4. Use the Grab (G), Rotate (R), and Scale (S) tools to your advantage.
5. Follow your reference images, and while switching from front to right view sort of trace the images.

## Extrude Tool

Another way to quickly create faces is to extrude them. You can extrude single vertices, or whole faces.

1. Select an Edge (two vertices)
2. Press “E” and the edge will extrude, move the mouse in the direction you want the edge to move.
3. Click the mouse when you want to “drop” it in place.

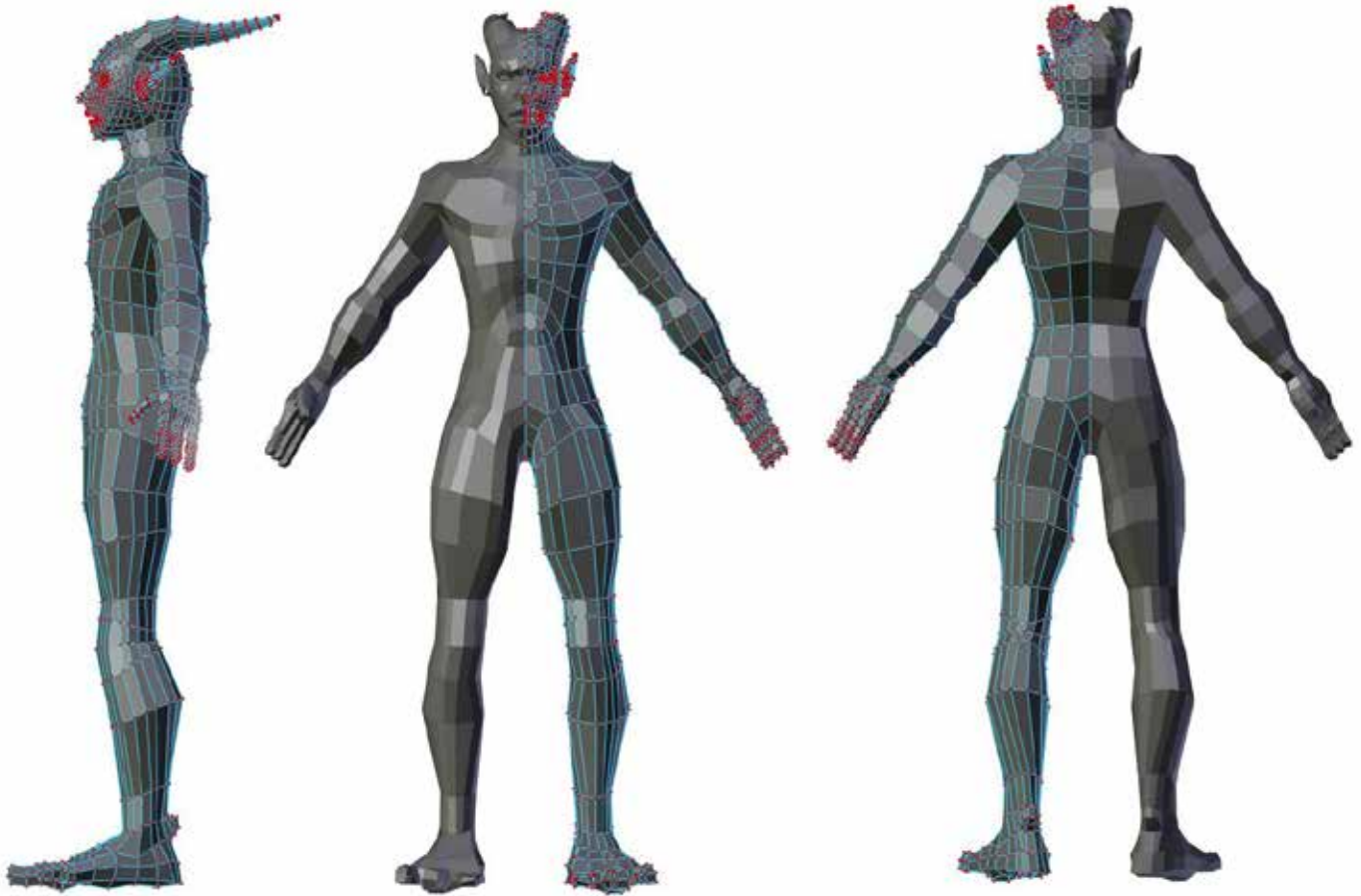
# Proper Topology

Topology is essentially the layout of the mesh. Notice how the geometry sort of loops around circular areas like the eyes? It is following an organic flow, or the flow of the facial muscles. This makes for better deformation if you are animating, and better light fall off considering the geometry is closer to real life objects.

When building your character make sure to use facial references if you are new to using proper topology. Bad topology can lead to bad deformations, or and ugly surface on the model.

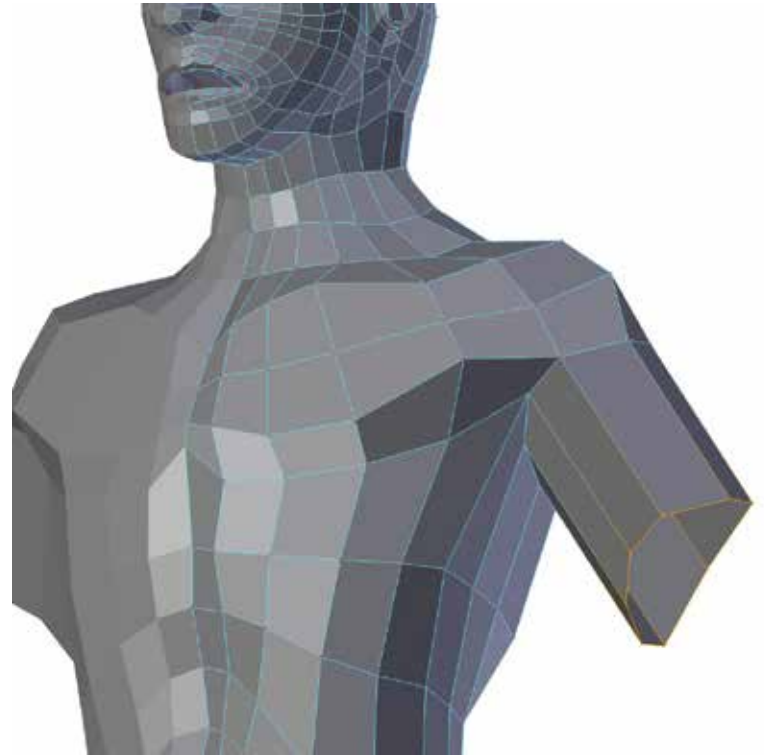
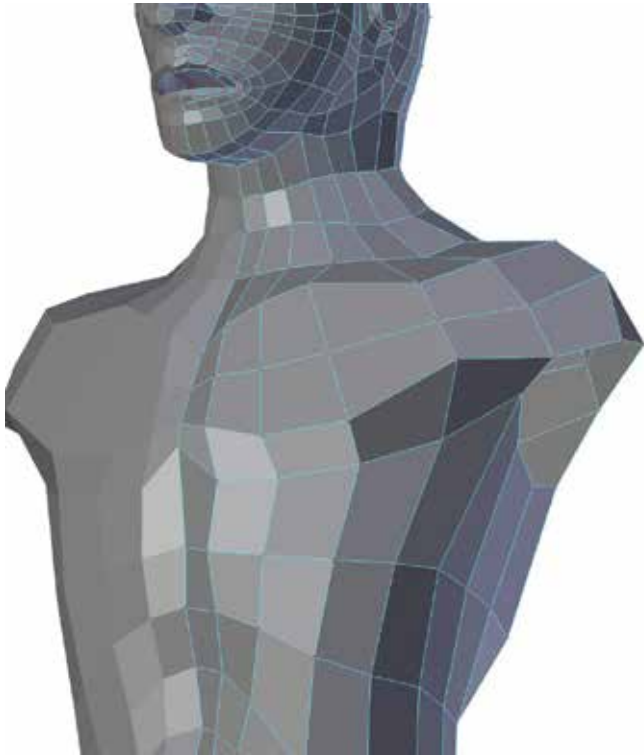
Keep your geometry in quads, or squares, and avoid using triangles and 5 sided shapes. Later in the creation process we will use the subsurface modifier. This modifier breaks down the geometry into smaller parts while smoothing it using complex algorithms, and works best with 4 sided shapes.

# Finishing up the Base Mesh

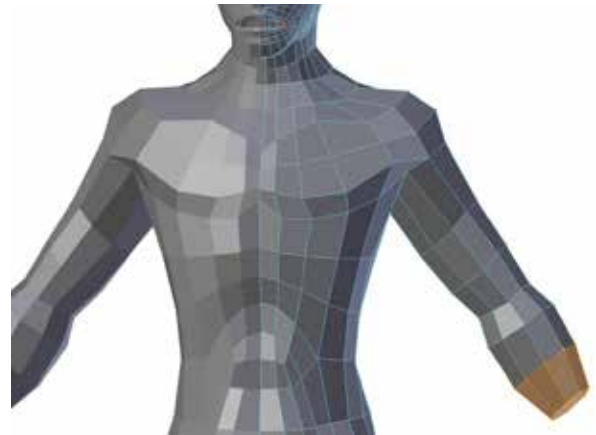


Continue following your reference images and complete the basic shape of the model. It doesn't have to be totally perfect, because it's a base mesh and we are going to sculpt it later. It's good to make sure topology is correct and the overall proportions are correct during this stage. When making a fantasy character you can afford to exaggerate proportions a little bit depending on your needs.

# Extrude Technique



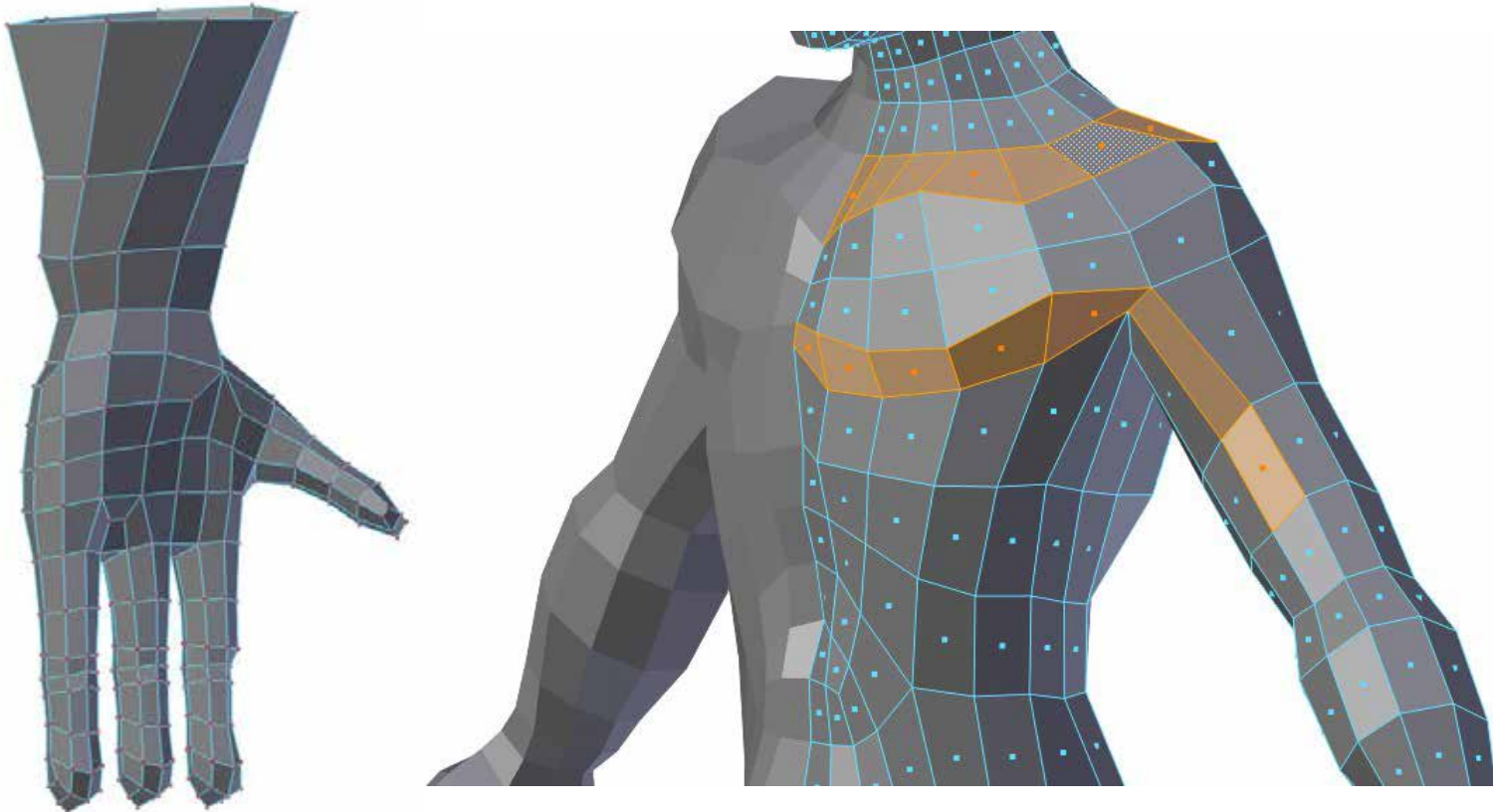
In the above image you can see the creation of the arm. The arm was extruded (E) from a hole where the arm socket should be. The vertices were extruded out, pushed down with the Grab (G) tool, scaled (S) to different widths as needed for the shape, and rotated (R) accordingly. The entire mesh was created using the extrude tool.



# Tough Spots

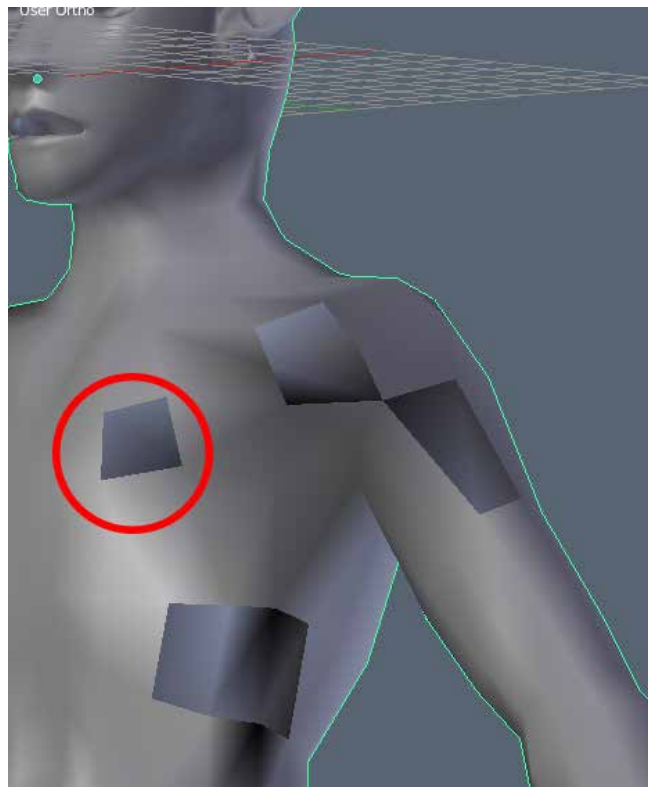
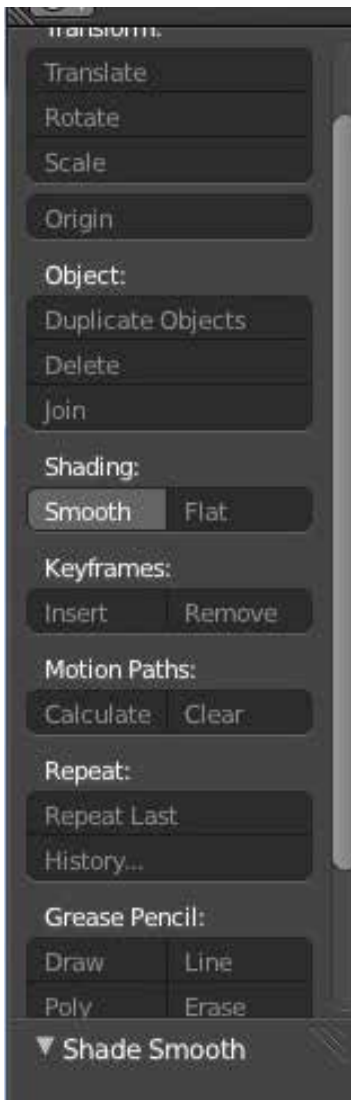
Two areas people have trouble with in modeling is the hands and chest. It is important to have good hand references from all angles in order to capture the likeness of a hand. I start with the fingers and extrude (E) out, connect them together by creating faces (F) from vertices. In my planning process I decided to go with only three fingers, because this is a fantasy creature.

For the chest, it is important to remember that the flow of the lower pectoral connects and runs down the arm, similar to how real muscles are. The middle part of the pectoral runs across and around the deltoids. This makes for a better deformation during animation.



# Preparing for Exporting

All faces should be facing outward. When we take the model to Zbrush nasty errors can occur (pictured below) if a face is inverted. The best way to do check this is to change the model to “Smooth Shading” under the Object Tools pallet on the left. If any face appear off as pictured, you will need to flip the vertex.



In this image you can see inverted normals, which look unsightly. This is caused by a face that for some reason is flipped inside out. To reveal these, smooth shade your model.

Highlight the model, and choose smooth shading rather than flat on the Object Tools pallet. This is pictured in the far left image.

To flip a vertex:

- 1. In Edit mode, highlight the inverted vertex**
- 2. Press “W”**
- 3. Click “Flip Normals”**



# Recalculating Normals

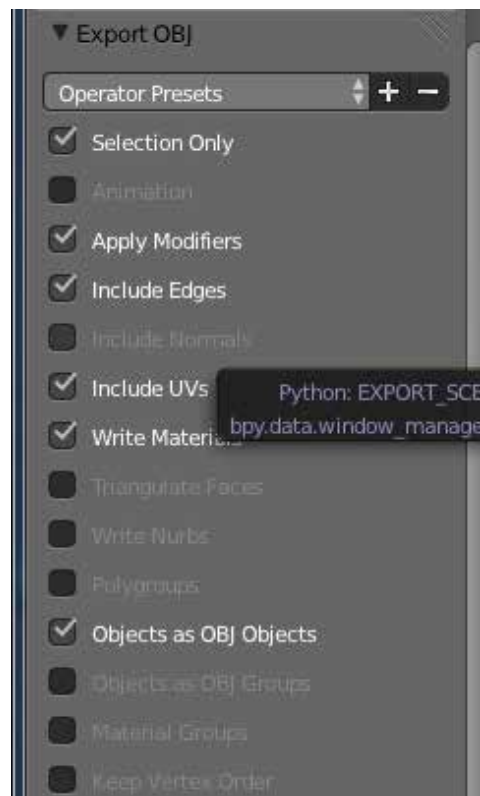
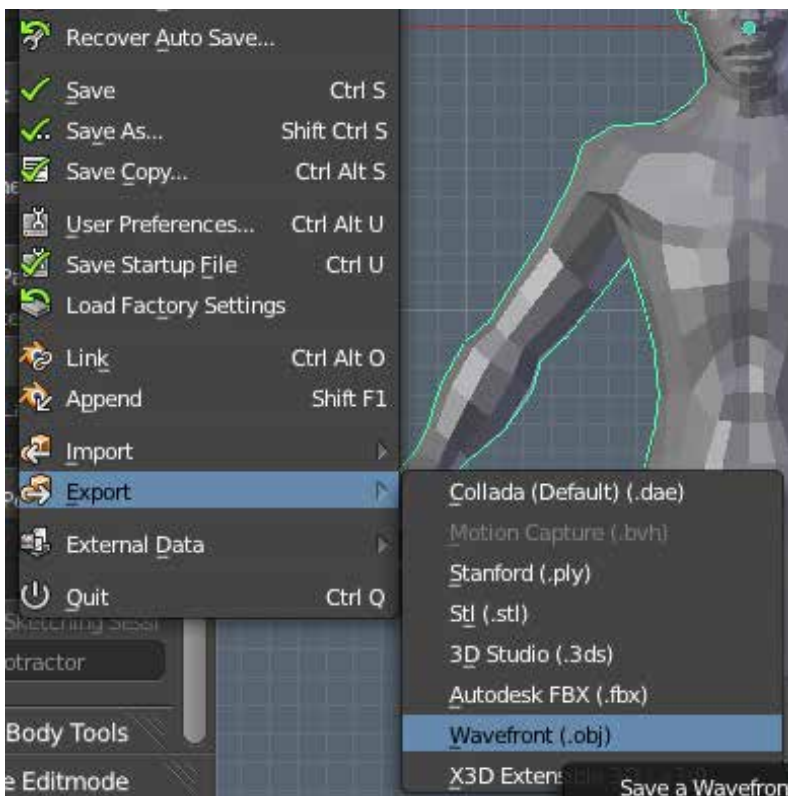
It's also possible to have Blender recalculate the sides of all the normals of your mesh. Highlight the whole model (in Edit Mode Press "A") and press CTRL + N. This will recalculate all the normals. Be careful though, sometimes Blender will INVERT all the faces, which won't show up in Blender, but will in Zbrush. If this happens you'll have to reload the model and Recalculate the Normals again.

Finally save the model in .BLENDER format. Always keep the base mesh, you may need to make changes later.



# Exporting The Model

Zbrush cannot read native Blender files, so we need to export the model as something it can read, for this we'll use the Wavefront Object format, .OBJ.



1. Select the just the model
2. Go to FILE, EXPORT, Wavefront (.OBJ)
3. On the left under Export OBJ, check "Selection Only" (otherwise blender will export everything in the scene which Zbrush doesn't need.)

4. Make sure "Apply Modifiers" is selected. This will insure that both sides of the model are exported.
5. Name it whatever you want, I usually do something like "basemesh\_obj.obj" so it can be identified easily later.

# To be Continued...

That's all for part one! By now you should have the knowledge to create your own base mesh. In Part Two of this series we will look at how to import your model into Zbrush, and learn the basics of sculpting.

You would do well do brush up on your anatomy for Part Two!



Facial Sculpt from Part Two

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