**Introduction to 3D Modeling**

**Go to:** SculptGL - https://stephaneginier.com/sculptgl/

Getting *oriented* in 3D modeling can feel a little weird at first. So let's talk about what it means. Picking up a physical object in front of you, can you turn it around in your hands? This is you changing the object's *orientation*.

**Orientation**: the position or direction of something. (the way an object is facing)

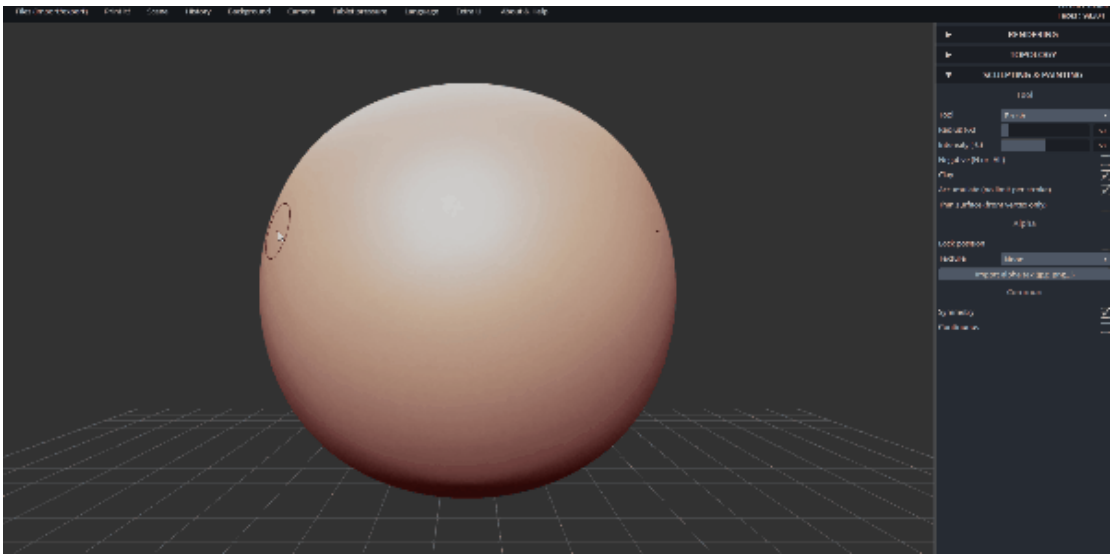
**Step 1: Draw a Smiley Face**

*(This lets you know where the front facing orientation of your object is, this is important for building our models)*

Using the left-mouse button, you can sculpt a smiley face into your sphere.

Other tips that might be useful:

- Holding Alt while you draw makes your sculpting *negative* (it cuts into the sphere, rather than building up onto it).
- Ctrl+Z (like always) can *undo* a mistake you make.



Now we're going to move our sphere around.

To change the orientation of your sphere, **Right-click + move your mouse.**

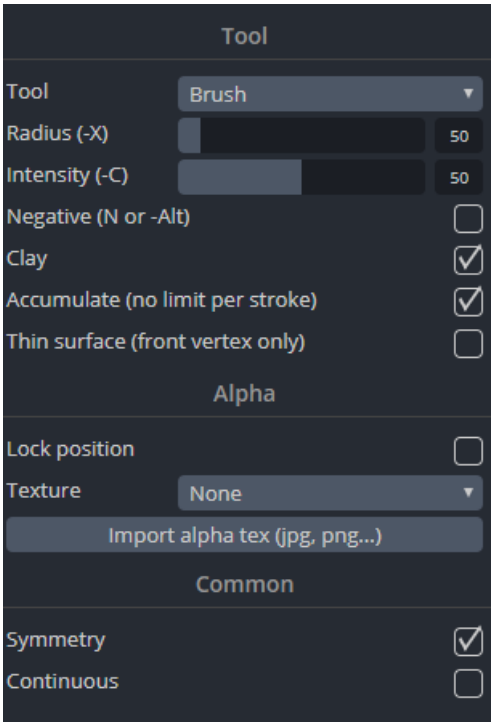
**Step 2: Rotate the sphere**

Some other useful orientation keys:

- Left to Right arrow will pan (move horizontally) over your model
- Rolling the mouse wheel, or the Up and Down arrows will zoom in and out.
- Clicking and holding the mouse wheel will let you pan up, down, left, and right across your model.

## Step 3: The Brush Tool

The tool we used to draw our smile was called the brush tool. You can see this in the panel on the right along with a lot of checkboxes.



Here is a summary of some of the more useful options for the brush tool:

| Tool | Description | Illustration |
|---|---|---|
| Radius | Changes the size of the “brush” you use to build onto your shape. |  |
| Intensity | Changes the amount of “virtual clay” the brush adds (or subtracts) from your model. |  |
| Negative | Makes the brush “carve in” to the shape rather that “build out” of it. |  |

| | | |
|---|---|---|
| Symmetry | Makes your brush affect both the left and right sides of your model. Good for making flowers, bodies, or faces, which often have some symmetrical parts. |  |
| Continuous | Makes your brush continuously add (or remove) “clay” to your blob as long as you have the button pressed. |  |

**Step 4: The Drag Tool**

The drag tool is an important tool that helps us stretch our sphere into different shapes. To change a tool, go to the top of the panel and select the tool menu. You’ll find Drag listed as eighth. You can change the radius to change the area that you are dragging.


**Step 6: Exploring Other Tools**

Explore the other tools like **inflate, twist, flatten, smooth,** and **paint.** They work similarly to the above-described tools, but each has a different function.

## Step 7: Creating “Humanoid” Figures

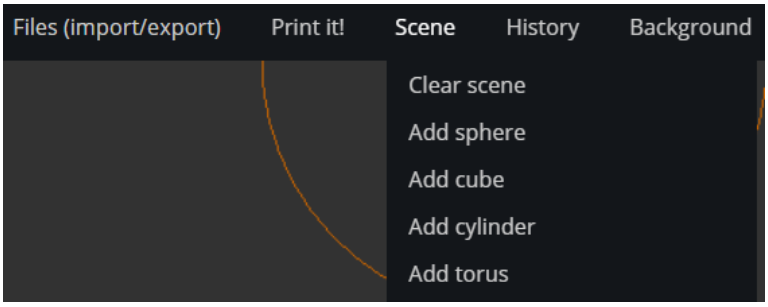
For our next step, we’re going to be creating a 3D figure that we can animate. For this step, we’re going to be using a program called **Mixamo** (https://www.mixamo.com/). For Mixamo to work we have to create a “humanoid” figure that it can “rig” with an animation skeleton.

**Humanoid -** In animation software, “humanoid” means a figure has two legs, two arms, a torso, and a head. (Even though *there are plenty of humans* who don’t have two arms and legs. And some non-human things that have two arms and two legs...)

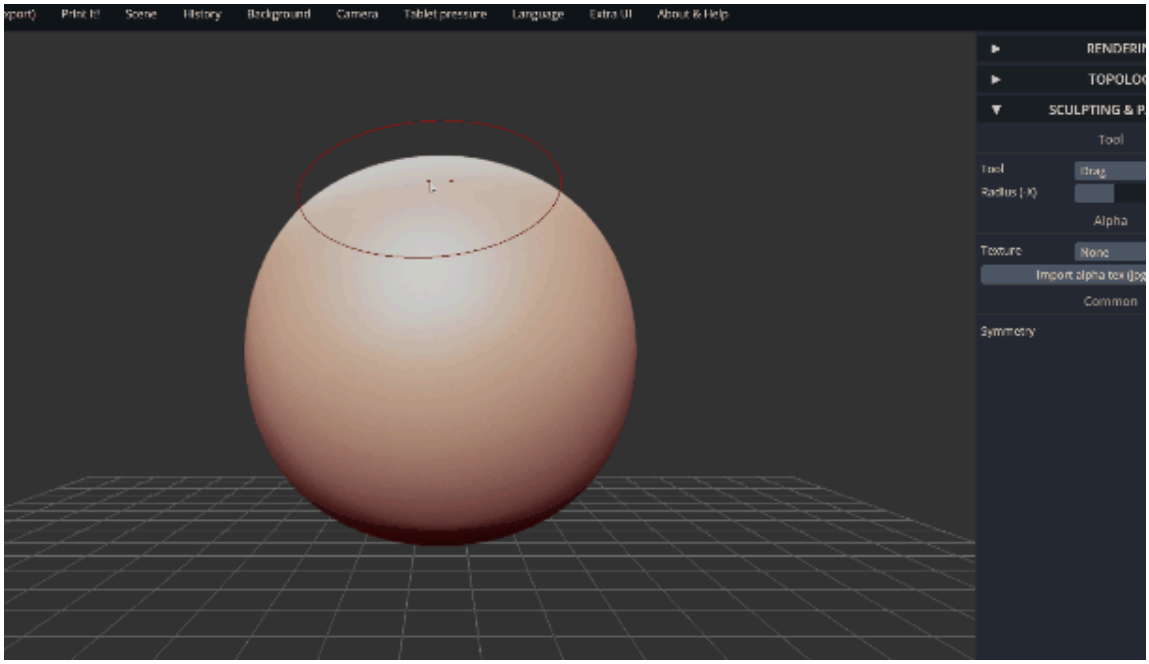
Let’s try creating a monster-like figure that has two upper limbs, two lower limbs, a torso, and a head.

Note: The head cannot be in the belly (aka no Kool-aid man). This is because the “humanoid” animation skeleton needs different points for the “chin” and the “groin” parts of the body.

For now, let’s just make a simple Turtle Dude! In the menu bar, go to **Scene-> Clear Scene** then **Scene -> Add Sphere**




1. Select the Drag Tool.
2. Turn on Symmetry.
3. Make two arms, two legs, and a head at the top.




**Step 7: Export**

At the top menu, go to: **File > Save .obj** (which stands for "**object file"**). This will download a file called **yourMesh.obj** (but you should **give it a more descriptive name!**). Save it to a folder where you can find it later (I usually make a folder on my desktop).

Then go to **File > Save diffuse** (which is a 3D modeling term for surface color - since color results when white light is "diffused" by a surface). This will save a **PNG** image file of the colors for use later.

(IF YOU GET AN ERROR THAT SAYS "The Selected Mesh has No UV!" No worries. Jst **Save .ply** instead. This format isn't as compatible with our other tools, but we have some tutorials for later on how to extract the colors from a PLY file and make it usable!)