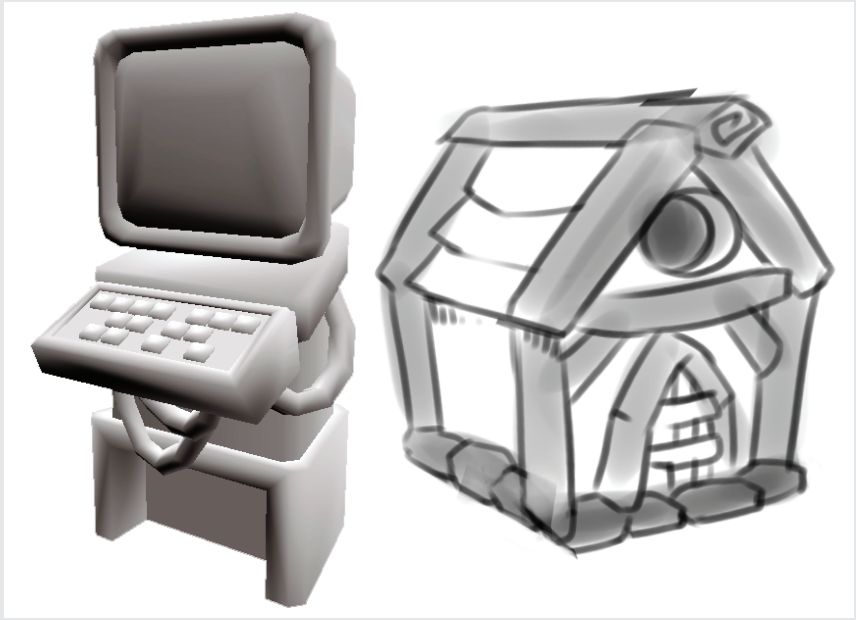
Style and general 3D guide for SS3D

This is aimed at people who have the Blender basics down. Many people wanting to contribute are new to modeling so while there's some general art advice, everything applies to SS3D.

This PDF covers topics in order of priority. Silhouette is the most important thing, try not to add color or detail you're satisfied with the shape of the model.

Shape

Remember that items will be seen from pretty far away, so zoom out early and often, and always look at your work from all angles.



Proportions

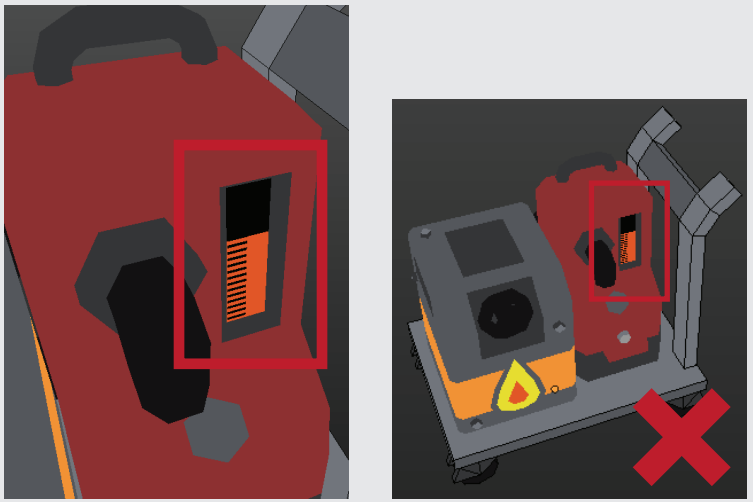
Stylisation involves emphasizing the defining parts of an object. When modeling something that exists in reality don't try to accurately reproduce it, even with reference the goal is just to make a caricature of the real thing.

Detail

Focus on details that contribute to the silhouette. A gun barrel or tube doesn't need to be hollow, it's enough if the end cap is a darker color or just solid black.

If certain details are important but too small to be noticeable, make them bigger. As a poor example, you don't need 101 keys to model a keyboard the same way you wouldn't draw every brick in a wall, just enough so that it's readable as one, and big enough that it can be seen from far away.

Don't get attached to close shots of your model. Too fine or complex detail might just become noise when viewed from the proper distance, so zoom out often.



Polycount

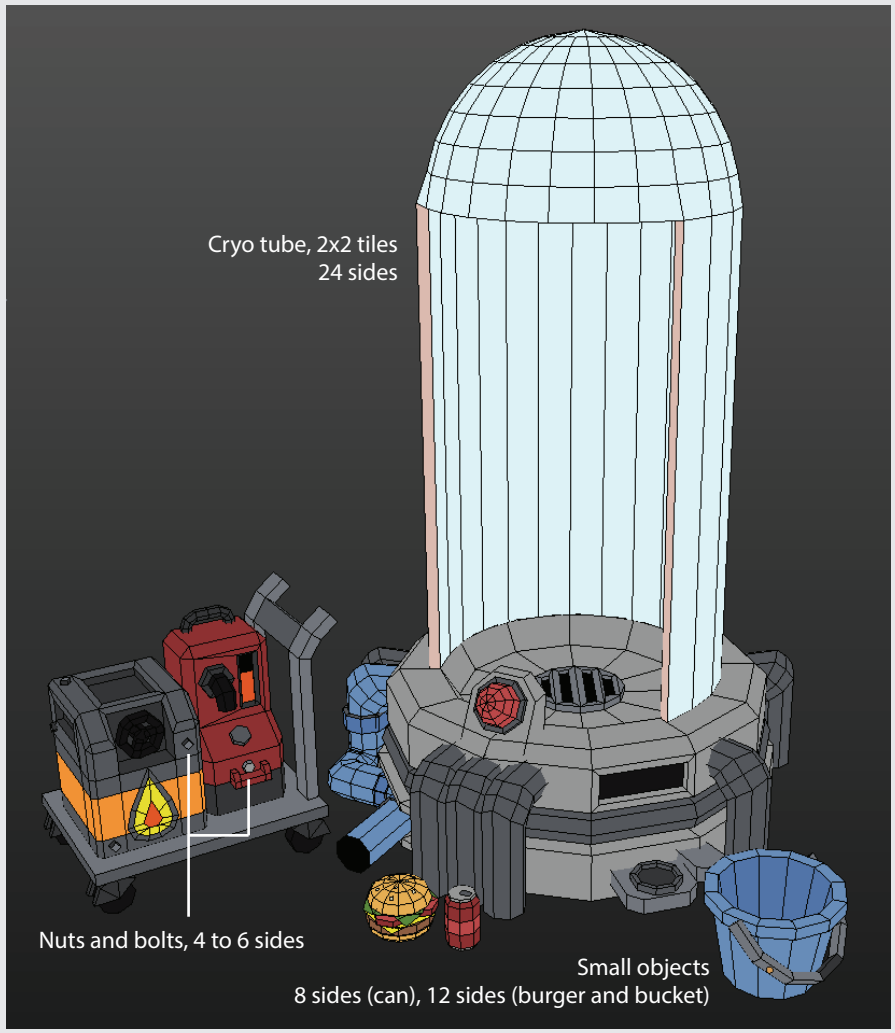
The current year is two thousand eighteen and modern computers are capable of rendering millions of triangles per frame. Low poly is largely a stylistic choice, but SS13 is a sandbox game and it's not unreasonable to expect that hundreds of objects could be on screen at the same time.

It's also about consistency— objects that are very polygon-dense will look out of place next to their low-poly friends.

How many sides should my cylinder/sphere have?

Enough that it looks like a cylinder from camera distance. Larger objects have more sides, as well as objects that should have glossy highlights like the cryotube on the right. It's difficult to correct this later in the modeling process.

Remember to turn on smooth shading by selecting all faces then `Ctrl-F > Shade Smooth`. Select a matcap from the Shading panel on the right, regular Blender lighting is distractingly shiny and bumpy. Matcaps don't affect the material whatsoever, it's just a preview within Blender.



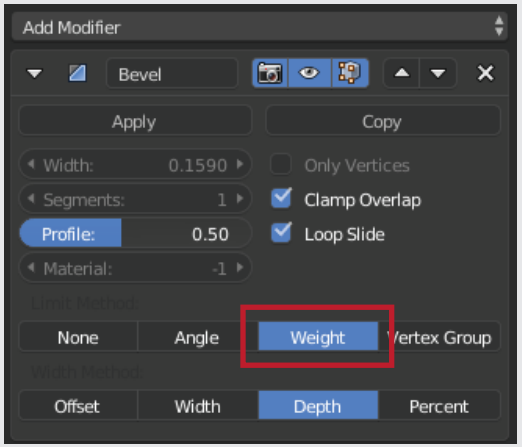
Bevels

Bevels are very useful in hard surface modeling since they catch and reflect light, highlighting the edges of an object. SS3D though has a rough clay look, with left smoothness as a special effect for things that really need it, so bevels are not that important and mostly optional.

Do add them when your object has large flat surfaces, like a fridge, which otherwise would look like a tall box. Small objects or small parts of larger objects don't need them, since it would have little impact on the silhouette.

Alternatively use the Bevel Modifier in combination with bevel weights, which you can set individually for edges in the model.

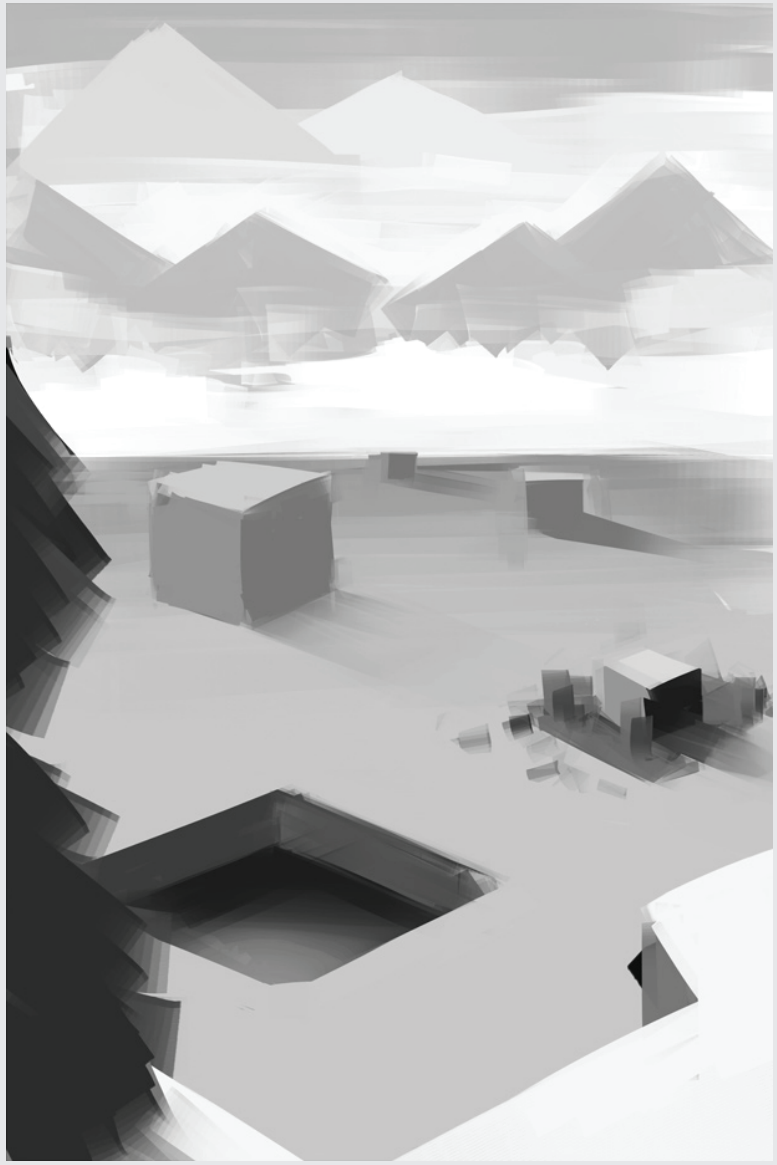
It's easier to tweak but I recommend applying the modifier after you're done with it.



Value

Value is brightness independent of the color you use. If you were drawing a picture that would be the end of it, but in 3D, value is a function of the shape of your object *and* the lighting ingame, which could come from any different angle.

You can't control lighting, but the shape of the object is up to you. If computers could draw an infinite amount of polygons you wouldn't have to worry about anything else, since you could just perfectly describe the surface of any object.



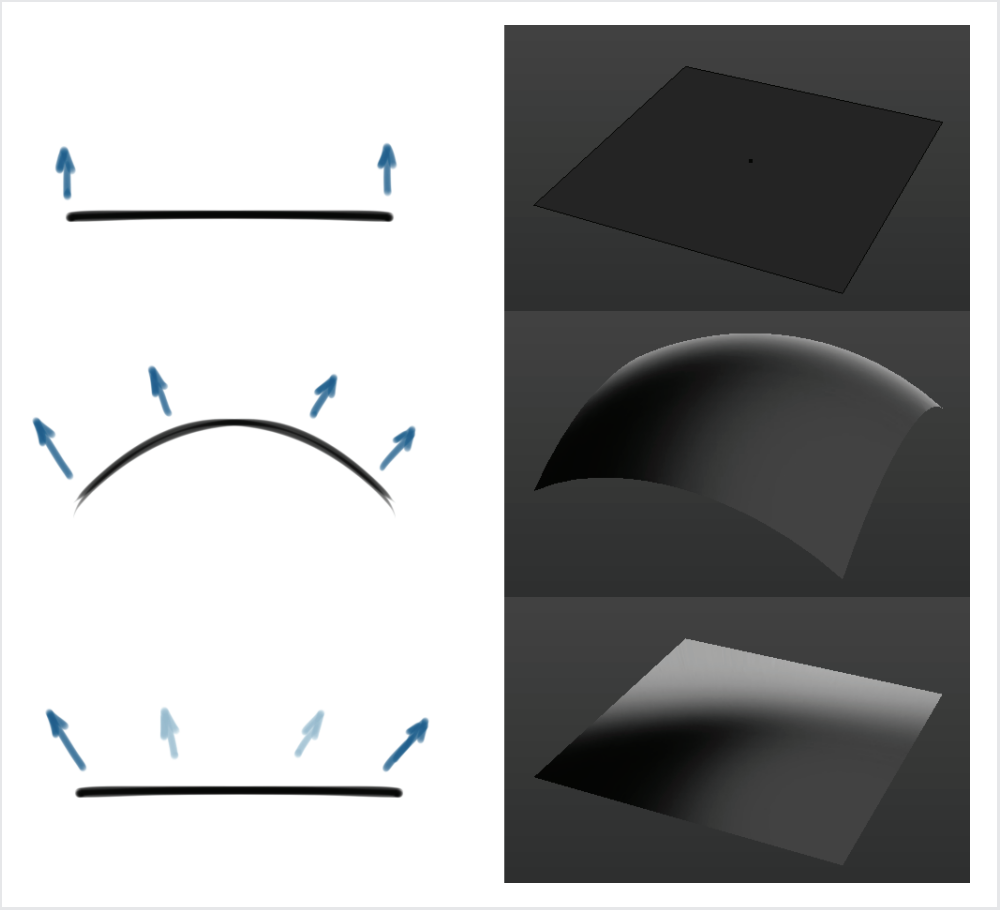
Normals

But we have a limited polygon budget so we rely on *normals* to make up for it. Normals are just the direction the surface is facing, which by default is straight up from each individual face. By tweaking these directions you're "bending" the surface even though its shape hasn't really changed.

A flat quad. The normals are sticking straight up as expected.

Slice of a sphere with way too many polygons.

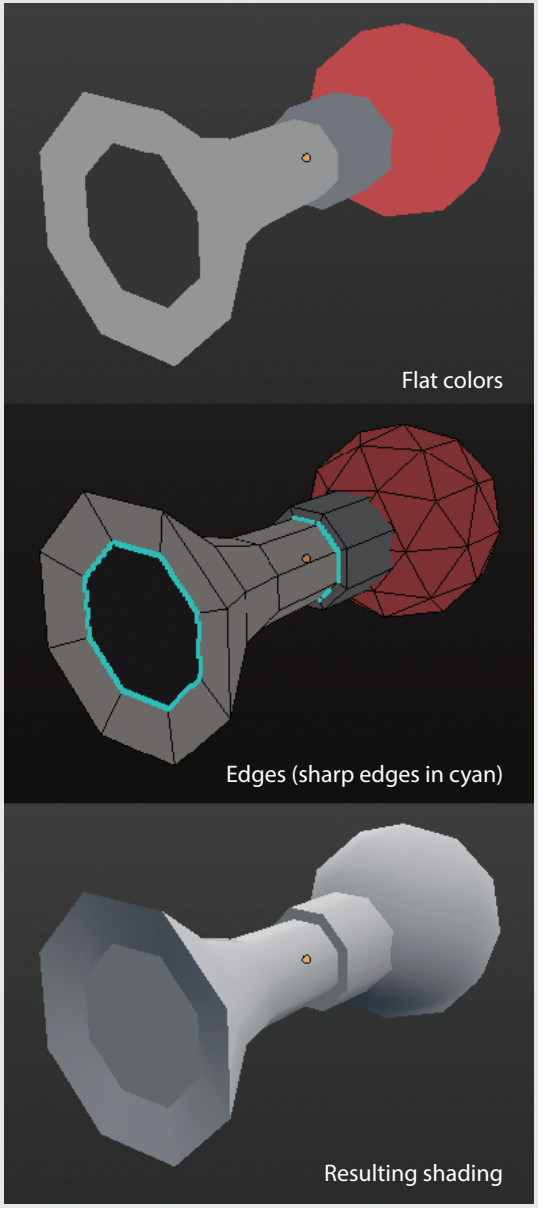
Taking the normals from the sphere and onto the quad, we get a plane that appears to be round, for no extra rendering cost over the original.



Mood in a single SS13 round can vary wildly, and lighting needs to lend itself to both calm and spooky situations. Under regular conditions, like well lit Medbay or hallways, objects are fairly uniformly lit so normals aren't that big of a deal.

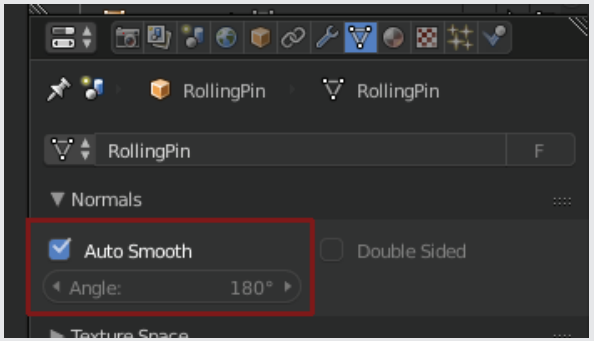
This is intentional as the skill floor for creating new assets shouldn't be high. The exception to this are objects with large flat surfaces, which can look pretty different.

ADD PICTURE



Sharp edges

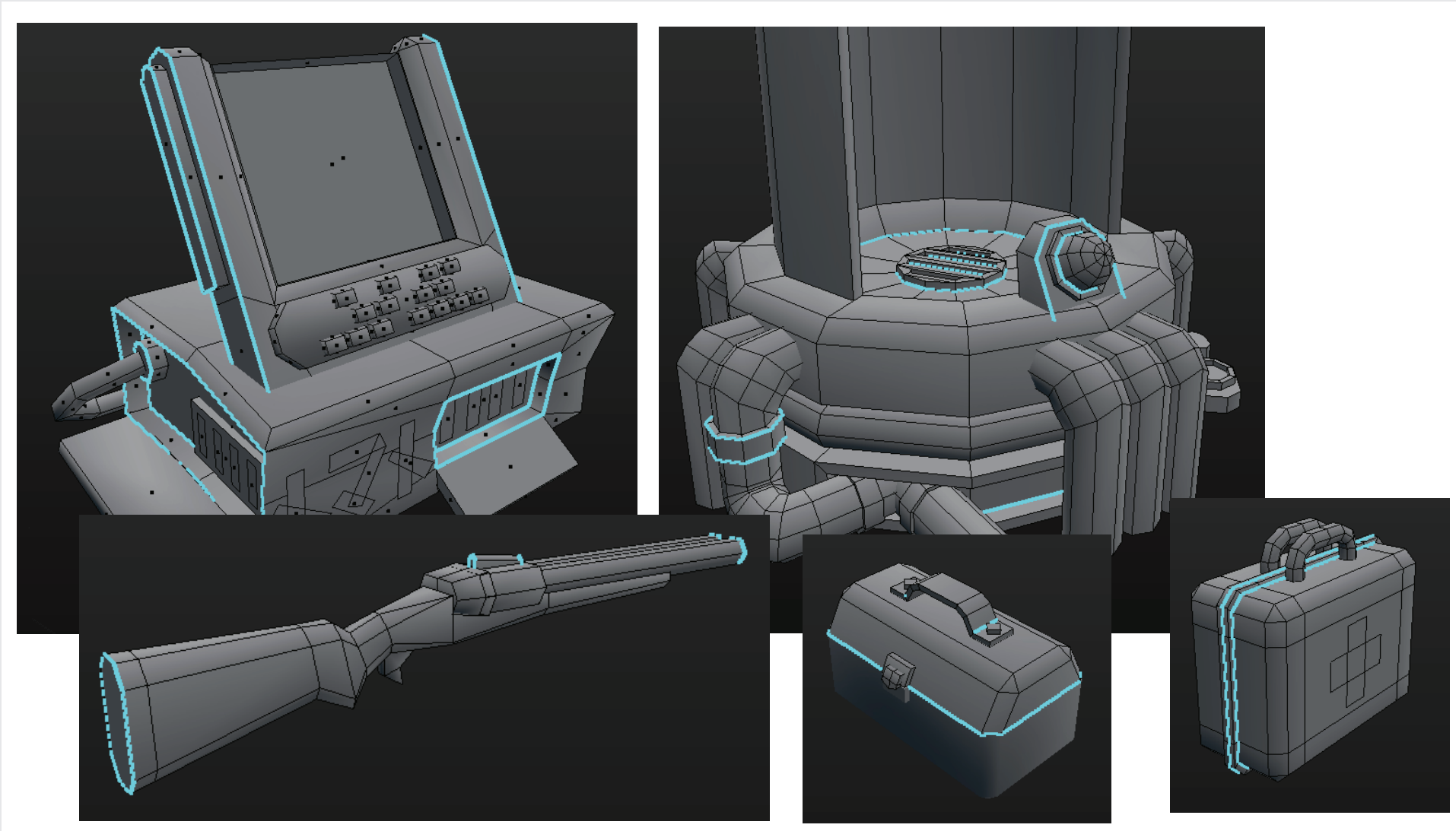
Sharp edges are hints for Blender to do the normal splitting for you. Setting sharp edges is very easy, just put them down wherever there should be a discontinuity in the surface. The base of a bolt sticking out of plating, two different materials making up the same surface, or the seam where parts of an object would be welded together.



Use smooth shading on the whole model and then enable Auto Smooth in the mesh tab to make use of sharp edges.

Values lower than 180° will "auto sharpen" angles below this value, which can be handy if your model is complex.

Some examples. The tubes going into the cryo don't need it, since sharp edges are used to split continuous meshes and the tubes are separate from the base.



Color

Palette

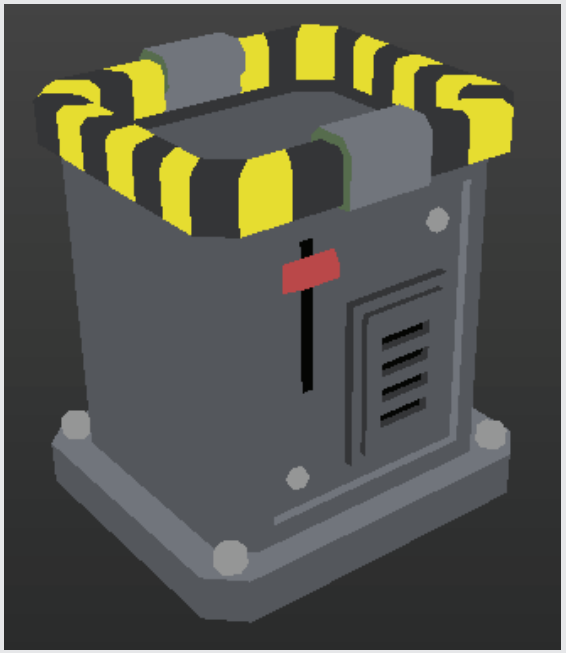
Having a palette has many upsides. It removes the need to learn texturing and also UV unwrapping, which is a tedious mechanical process that would raise the entry barrier to making SS3D content. It makes it really easy to try different color variations, and it helps with cohesion.

The current palette is a mess, but use it whenever possible. Adding new colors is fine.

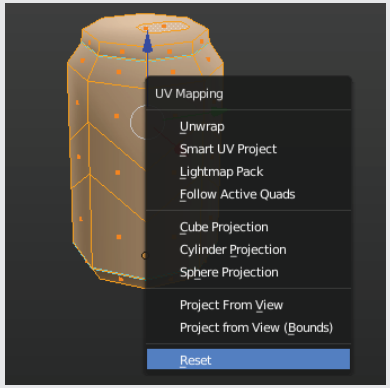
Baked in shadows

By coloring parts of the mesh with a darker shade of the same color you give the impression that it's casting a shadow on itself.

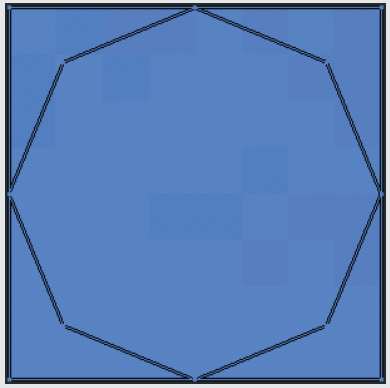
Old games did this a lot, but it should be used very sparingly— it can look very wrong when light shines directly on the darkened part. The disposals bin can't rotate, so it's safe to assume light will be hitting it from above.



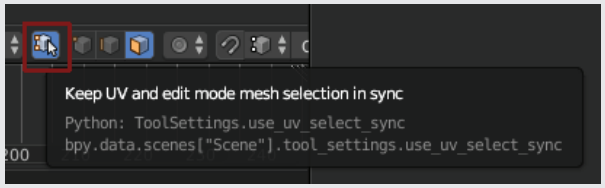
Using the palette



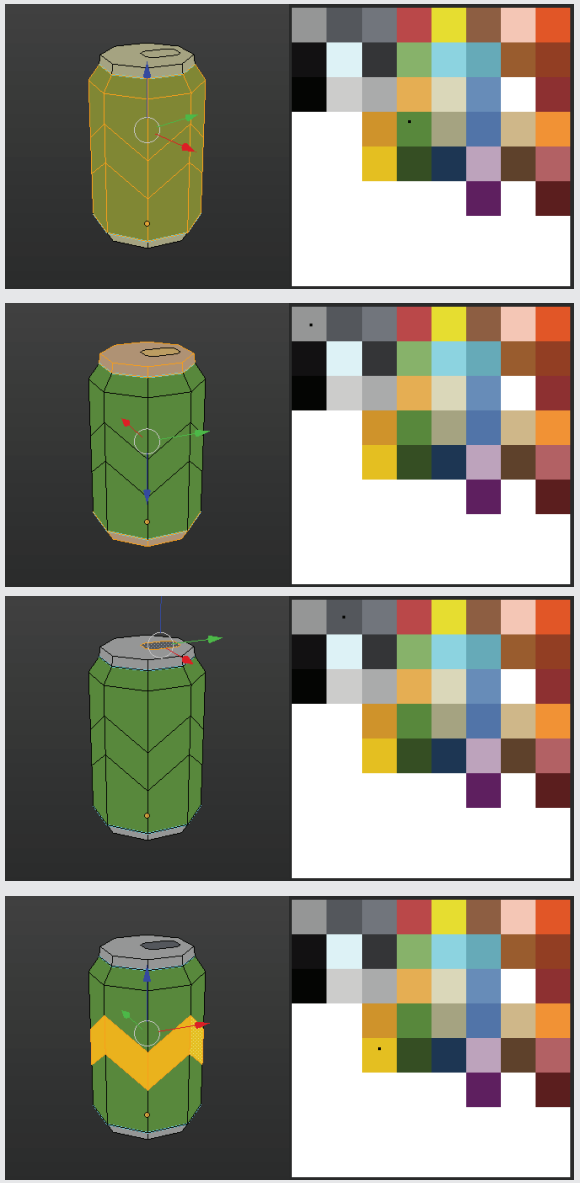
At this point the model has no UV mapping. Select all faces and press U > `Reset` which is the most unwrapping you'll need for most things.



Make sure everything is selected in the UV editor then scale it all down into a single point (S 0)



This toggle in the UV editor can help.

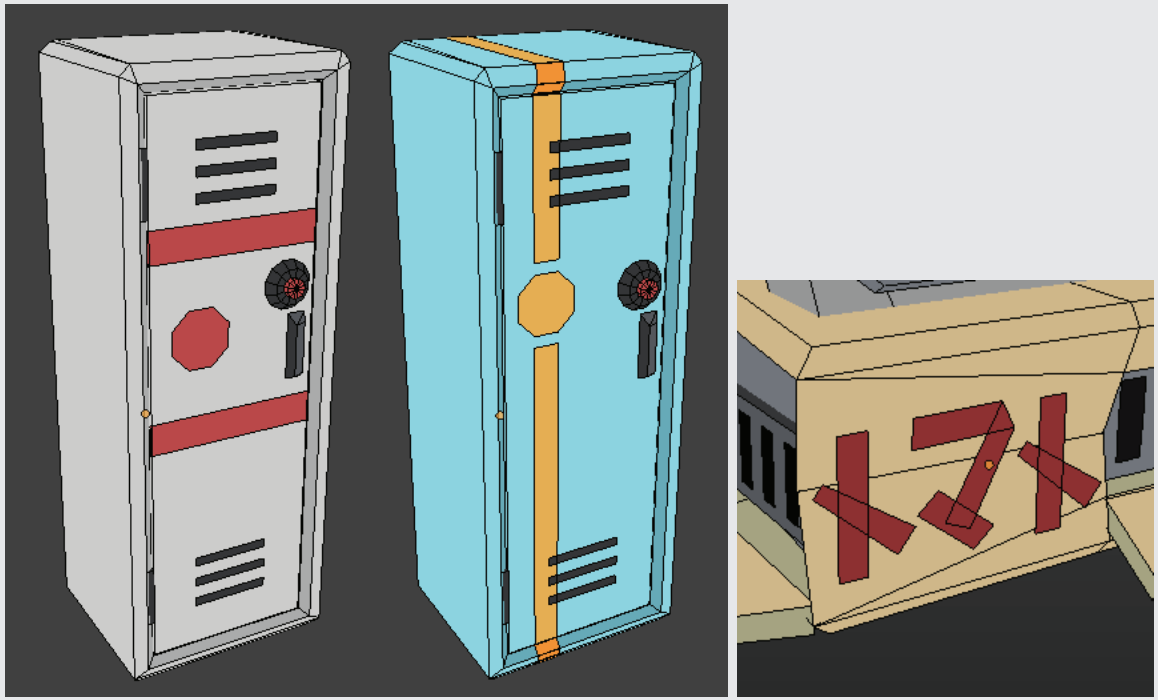


Select the faces you want to color, then drag the corresponding points in the UV editor to a swatch in the palette.

To speed up selection, you can make use of sharp edges to flood-fill select by hovering over a face and pressing L.

Textures

Textures may be used for repeating patterns, or where cutting up the model to add colors may cause problems. Complex text or symbols can use a transparent texture, and of course posters and pictures are alright. For simpler things consider just using flat polygons.



These simple decorations are floating just above the object's surface. This also includes the "fake" grates on the lockers. They're too small and the camera too far for the player to ever notice.

Textures.

Theme

I've seen it called retrofuturistic, but that would imply that tech is fixed and has an unique inspiration.

I think SS13 is closer to reality, where technology moves forward but machines that grow old and obsolete aren't always replaced or upgraded. The result is a station where sentient positronics coexist with brain-in-a-jar cyborgs, and the crew uses dot-matrix PDAs to send messages to each other.

This happens in reality, even now the military is carrying literal nuke disks—

Published 3:52 PM ET Wed, 25 May 2016 Updated 9:51 AM ET Thu, 26 May 2016

The U.S. Defense Department is still using — after several decades — 8-inch floppy disks in a computer system that coordinates the operational functions of the nation's nuclear forces, a jaw-dropping new report reveals.

—while the navy organizes their documents on computers running MSDOS. In the end it's both funny and good since it gives creators the liberty to add almost whatever they want, present or future. I fully expect the HoP's account database to be stored in tape drives.

Geometry

Most of this should be elaborated on at some point.

N-gons

They're fine as long as they're flat and won't be animated.

Triangulating

Don't triangulate your models.

Inverted normals

By inverting the normals of a model you can achieve an interesting pseudotransparency effect. It's not realistic but we're not aiming for realism.

Double sided

Many thin objects such as paper, leaves or cloth don't need to have proper thickness, but for performance the engine does backface culling, where faces that are "backwards" aren't rendered. This can be avoided by selecting the mesh, duplicating and then inverting the normals.

Pivot

Always at the center (XZ) and base (Y) of the object.

Modeling with NURBS

Cables and wires, but also some round but geometric objects like the plastic "cup" chair.

Cell fracture

To shatter objects for ingame destruction. Takes some setup.