



## Assignment 1: Research and Planning World Building

While last semester focused on creating a species that lives in a dystopian future, this semester is about building a futuristic artefact with some historical significance. I decided to continue with my fictional Cyberthug universe in order to keep some continuity and further develop their world.

In semester 1 I initially created the Cyberthugs as a species that required artificial components in order to survive after the Earth's surface became a toxic wasteland. This was later changed to having them live underground and as a result the respiratory systems were omitted, mainly to prevent overcomplicating their design.

In semester 2 I'm developing their world further to give more context for the artefact. The Cyberthugs are now the descendants of a group of space travellers who were off-planet while a global catastrophe took place and wiped out all life on Earth. This group of travellers gathered whatever they could find and rebuilt humanity deep underground. 500 years later, the Cyberthug race is thriving and they are significantly more technologically advanced than 21st-century humans.





## Assignment 1: Research and Planning Te Papa Artefacts

I found all of these artefacts at Te Papa at the start of the semester. I'm not sure what all of them are meant to be as I forgot to take photos of the labels. There wasn't much visually related to the aesthetic I was going for. Most of the stuff here is cultural which makes sense and could still be useful.

Clockwise from top-left:

- A fishing lure with a stone built in. This flickers in the light to grab the attention of certain types of fish.
- A curved blade to cut through stuff (presumably weak tree branches or something similar).
- A work called Indra's Bow which involves dozens of glass balls with various herbs, gems and other natural materials contained within. It's inspired by the Hindu festival Diwali.
- Some brown glassy ball.
- Gum from a kauri tree (looks similar to copal and amber). Apparently it was used as chewing gum, among other things.
- A pillow made of jade from the Ming dynasty (1368-1644). I think this originates from China.





## Assignment 1: Research and Planning Te Papa Design

These are a few random things from around Te Papa that I thought could work well in the fictional environment for this assignment.

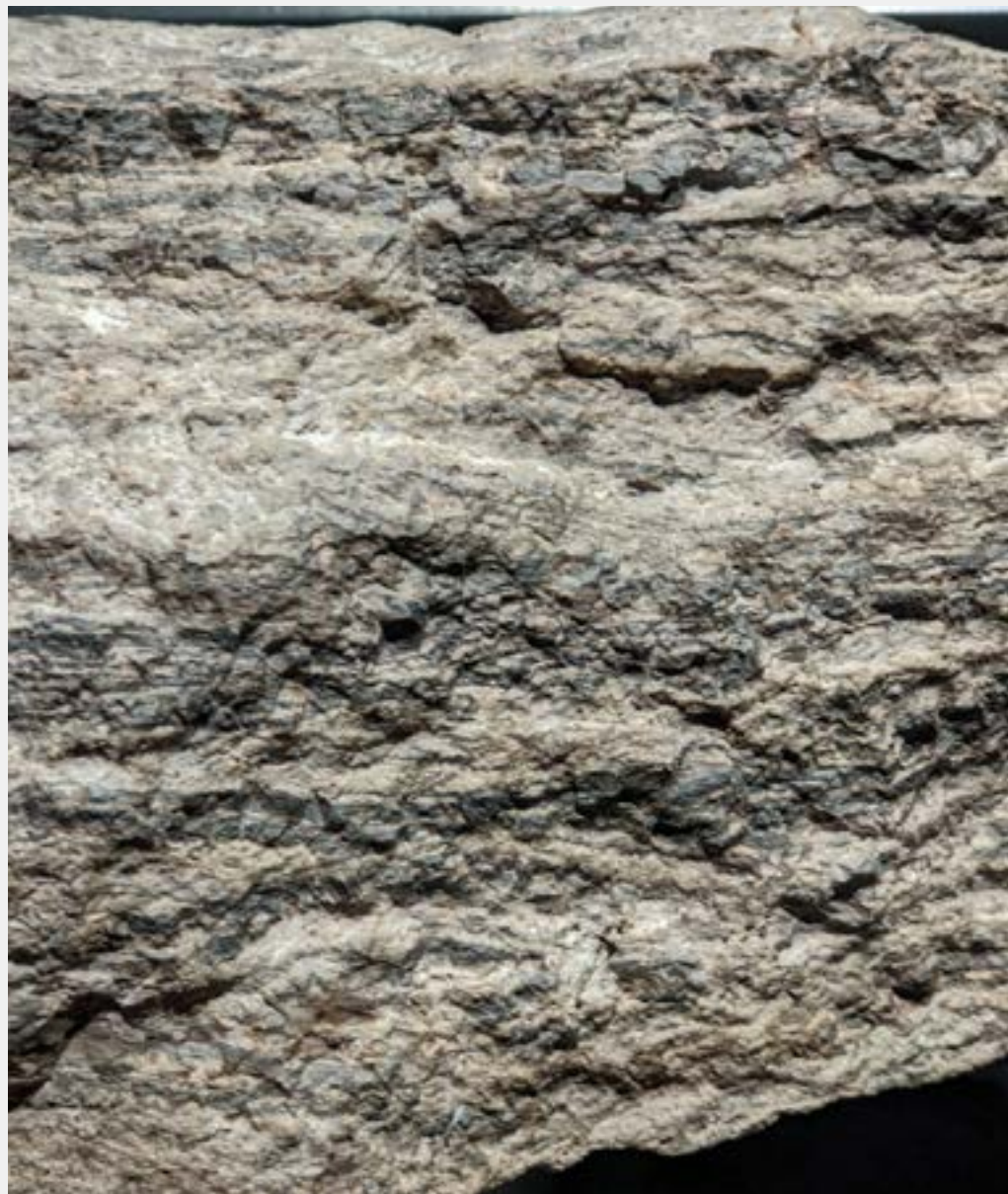
The volcano cut-through illustration looked different the first time I saw it, and by that I mean I thought the mountains were in the background and the lava bubbles were like platforms.

The purple cross thing is cool because it could be the sky blocked out partially by those bars.

The tables used some sort of proximity sensor to detect when a finger is near the screen (sort of like a graphics tablet) and would create a ripple effect on the surface. The layout of the whole photo reminded me of a control room on a ship.

The metal panels with holes in them create a cool effect when stacked as shown. Against a dark background this could create a cool effect where it isn't clear where the walls are. Like how mirrors make a room look bigger.





## Assignment 1: Research and Planning Textures

I bought a small cluster of amethyst last month from Cosmic Amsterdam on Cuba St, mainly to use for making cool photos. I took one where the whole frame was filled with the purple crystals and I thought it might look cool if there was an entire wall made of the stuff.

Digging through some photos from earlier this year I also found a grunge texture from an oven tray that needed cleaning.

The rest were located at Te Papa's nature section. On the bottom-left is a block of obsidian, and on the right are a rock and a bumpy wall texture, which I thought could be interesting to use for more humdrum surfaces.





## Assignment 1: Research and Planning Model Maker

Joshua Smith is an instagram model maker known for his realistic miniature street art.

Pictured here is his remake of Biu Kee Mah-Jong, a real location in Hong Kong known for their hand-crafted mahjong pieces. He's able to create an interesting tilt-shift effect with photos of his work due to the scale of it.

In the other photo, you can get a clear idea of the size relative to the bottle of paint, especially with the bars on the door window.

I admire Joshua's attention to detail and if I were ever to make a stop motion short film, he would be one of the first people I contact.







## Assignment 1: Research and Planning Prop Maker

Probably one of the most well-known props in sci-fi film history (and in my opinion the most over-rated), the lightsaber was created by George Lucas way back in 1977 for the Star Wars franchise, which he also created.

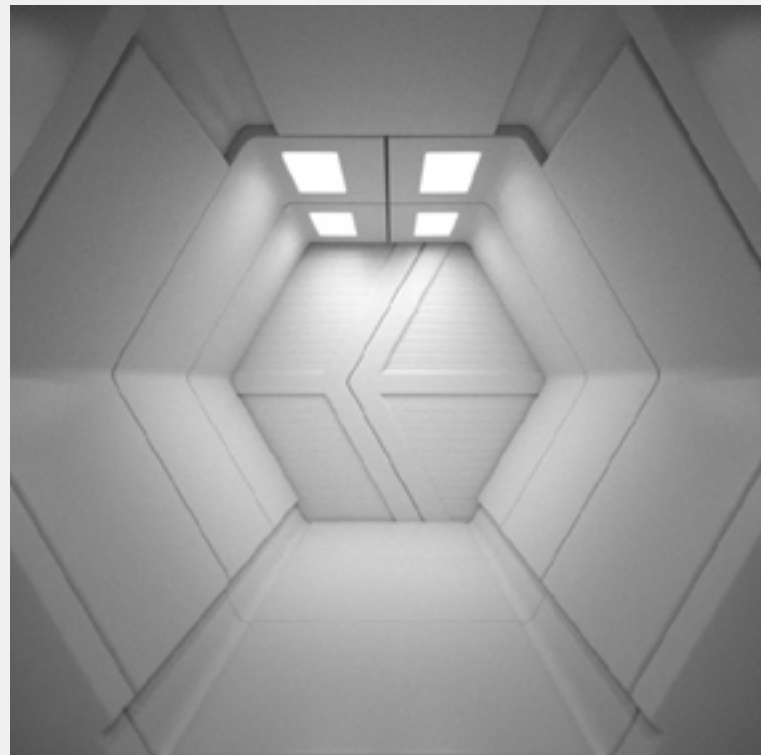
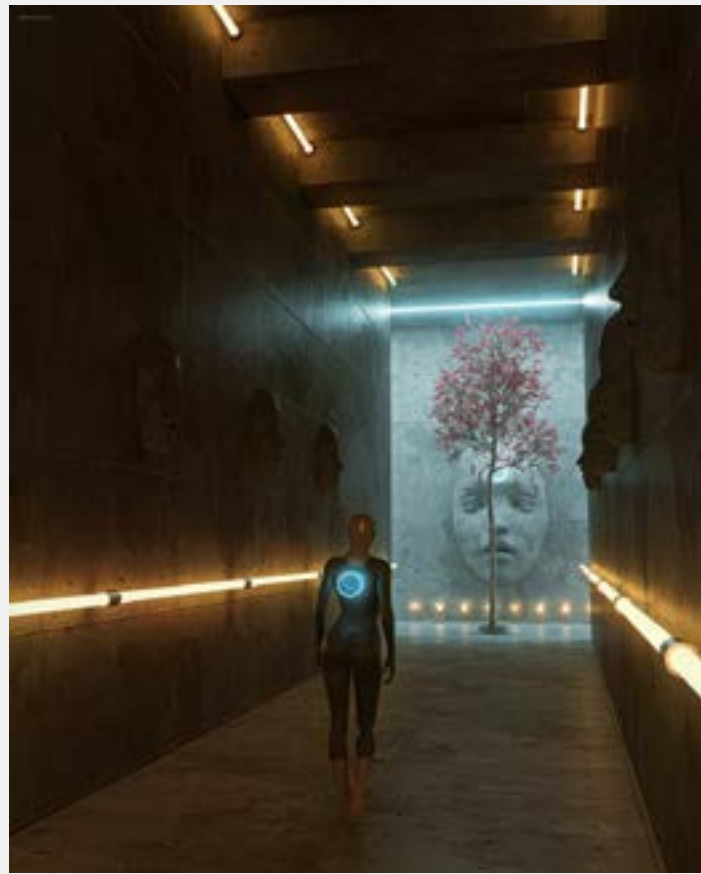
Personally, I'm not a fan of Star Wars. I watched Solo in 2018 and The Rise Of Skywalker (that was a mistake) in 2019, and I nearly fell asleep. Back in the 70s sci-fi space travel CGI might've been considered revolutionary, but all I remember from TROS is a young woman going to fight her angry cousin or something. I mean here she has not one but two lightsabers. It only took me five minutes to find that the fandom obsesses over different coloured lightsabers which apparently do different amounts of damage. The darksaber, from what I could find online, has an interesting design, and really gives the appearance of a dark power residing within.

Every movie in the series just feels the same. There's spaceships flying around shooting at each other ("pew pew"), characters fighting each other for 30 minutes straight with glow sticks and some half-memorable characters like Baby Yoda and R2D2. Also that Palpatine dude was in it, who I recognised from the "do it" meme.

Oh and George Lucas also made the Indiana Jones franchise, of which I've only watched one film (Lost Ark).







## Assignment 1: Research and Planning Environment Moodboard

The environment that the Cyberthugs live in will consist entirely of futuristic elements. Since everything was wiped out during the war, humanity's inventions basically went through a reboot.

I found these images on Pinterest (which is a great platform by the way). Interestingly, the use of hexagons seems to be a recurring pattern in sci-fi media.

Rather than copying these pictured environments as-is, I'll mentally break them down into elements, for instance, the cylinder on the bottom-left could hold the AI, and I quite like the ceiling of the top-right one. Actually the top-center photo looks great in terms of the AI chamber. Notice the blossom tree in front of the face which symbolises peace and tranquility.

The design of the bedroom in the top-left really appeals to me for some reason, but I would have to rework it somehow because the environment is underground, not in space.





## Assignment 1: Research and Planning Artefact Moodboard

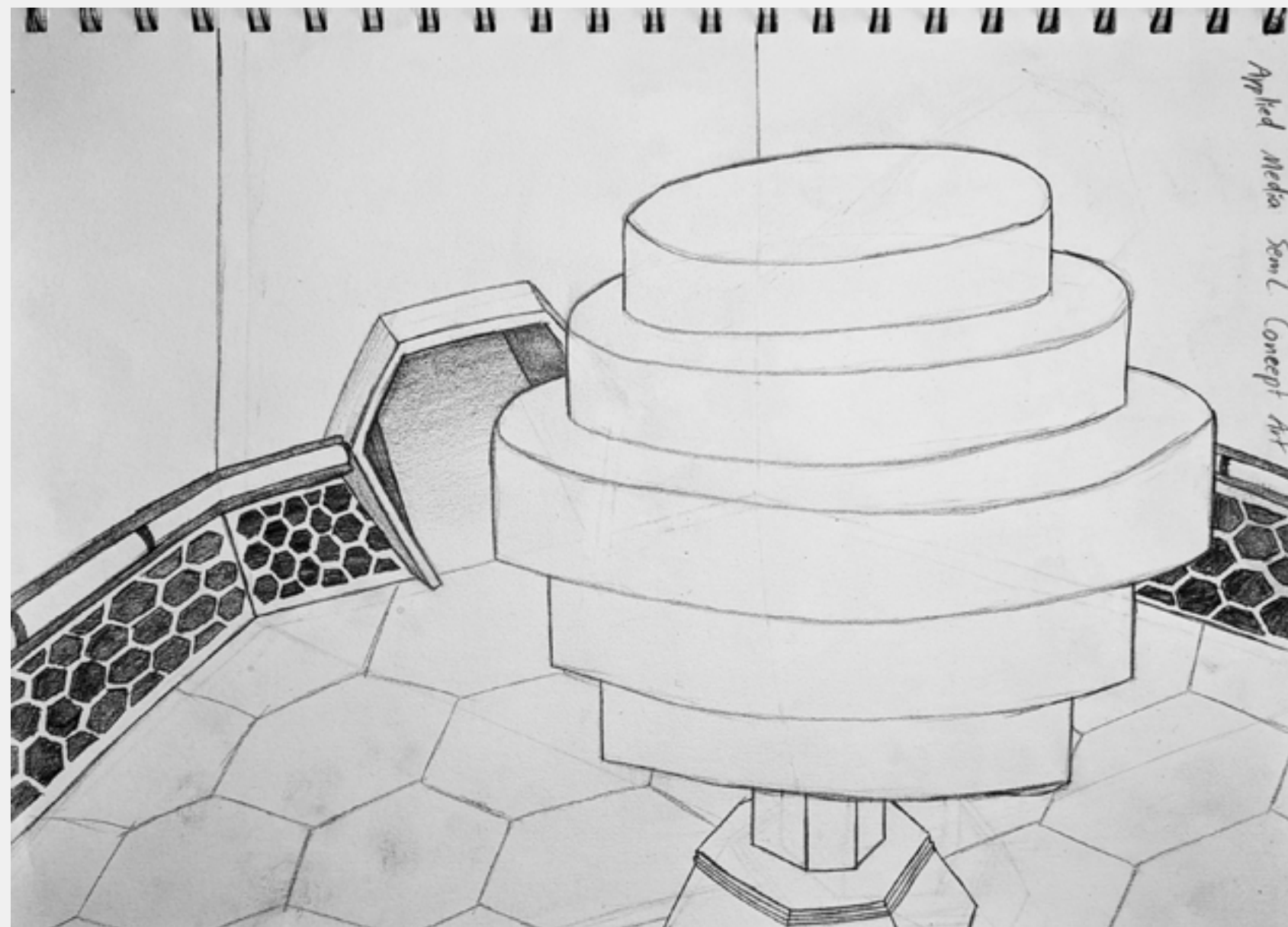
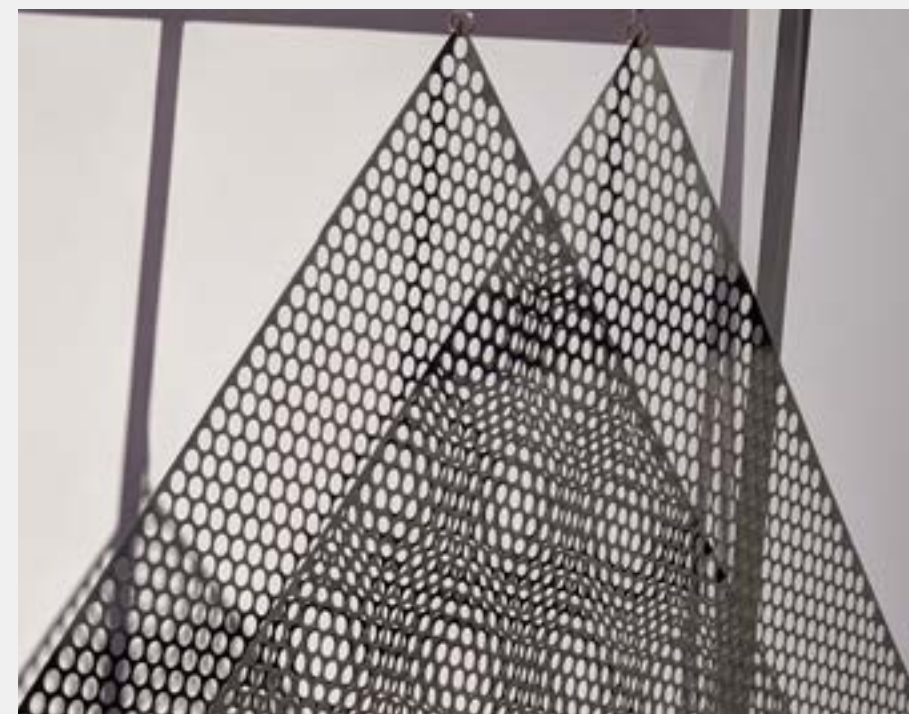
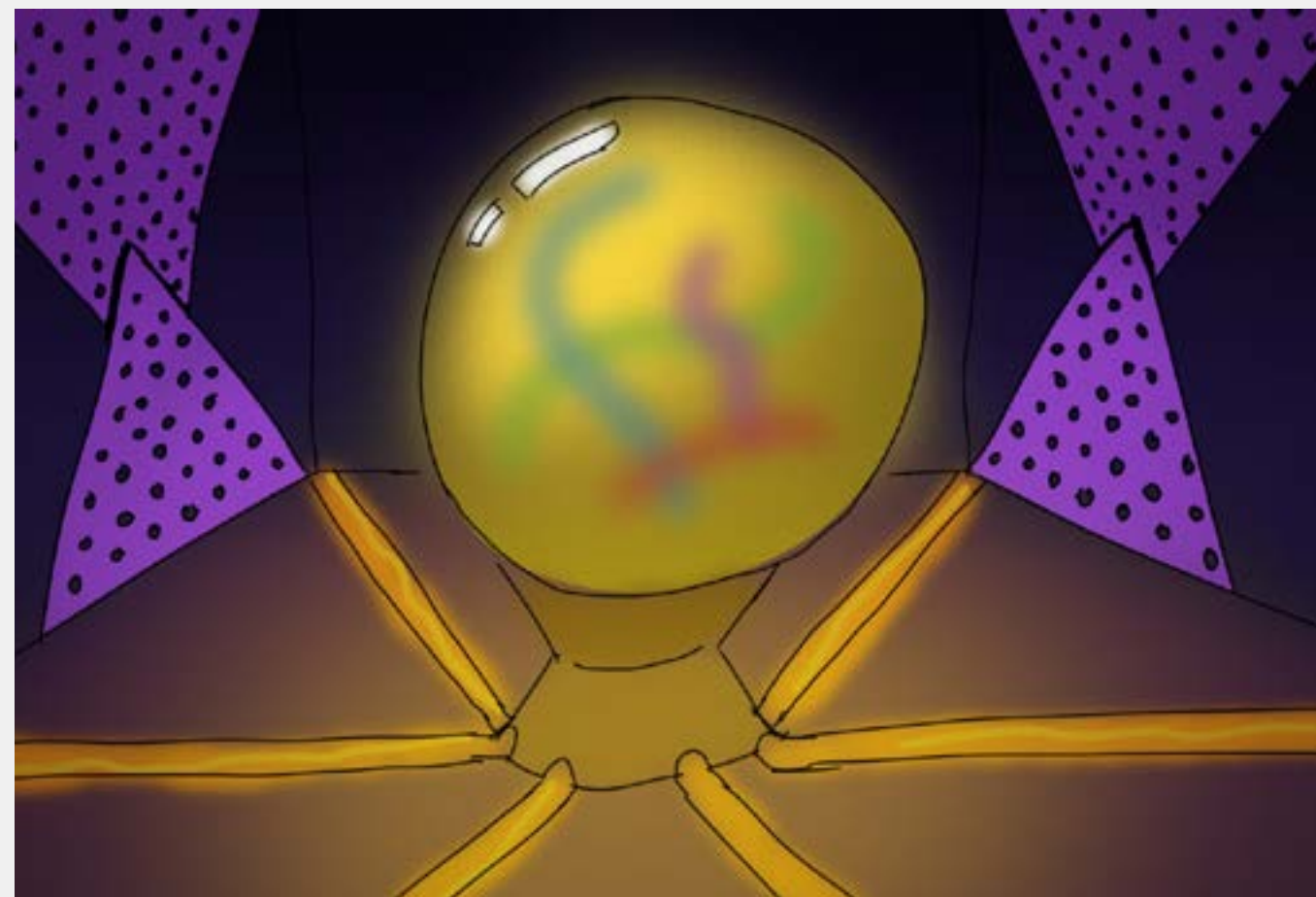
The artefact I plan to create is an artificial intelligence that will govern the Cyberthugs.

I wanted to break away from the present day virtual assistant stereotype that often features over-revealing female humanoids (for example, Fi from Zelda: Skyward Sword) and instead opting for a more abstract form (for example, Apple's Siri or Marvel's Jarvis).

I feel like the tendency for virtual assistants to appear feminine is left over from last century when the CEOs of businesses would boss women around to do stuff for them.

The day companies like Google and Apple shift away from that and create masculine sounding or even better gender-neutral/agender virtual assistants will be a step in the right direction in my opinion.





## Assignment 2: Concepts and Testing Concept Art

I decided to make the artefact an artificial intelligence that will govern the Cyberthug civilisation. This AI is benevolent and those it deems worthy enough will be permitted to access it and give advice on how to improve the civilisation for future generations.

When coming up with the idea for the AI, I had a few requirements in mind.

### Criteria 1:

The core needs to have the appearance of an isolated unit, while still giving the impression that its control flows out of the chamber and to other areas of the underground world.

### Criteria 2:

Being the most crucial room to the civilisation, the chamber must be structurally sound.

### Criteria 3:

There needs to be an illusion of depth somewhere in the chamber.

The first concept drawing was made very early in development, prior to coming up with the criteria. The purple triangles near the walls were based on the design I mentioned earlier which makes good use of the illusion of depth.

The second concept was made later, and complies with the criteria mentioned above. The triangles were replaced with a pattern built into the lower section of the walls, behind which maintenance pipes and cables can be seen. This change also improves the structure of the chamber. The hexagon pattern on the floor gradually rises like steps near the core, helping to illustrate the AI's importance.





## Assignment 2: Concepts and Testing Material Searching

*Due to lockdown, I wasn't able to test physical materials for construction of the artefact, so the text below was written early in the project.*

I had a look around Gordon Harris one morning for materials I could potentially use when it came time to build the artefact.

Pictured to the left are:

### - A hemisphere made from embedding resin.

This was interesting because it's a robust material but not the same as glass. I thought it could work well for the hive part of the AI.

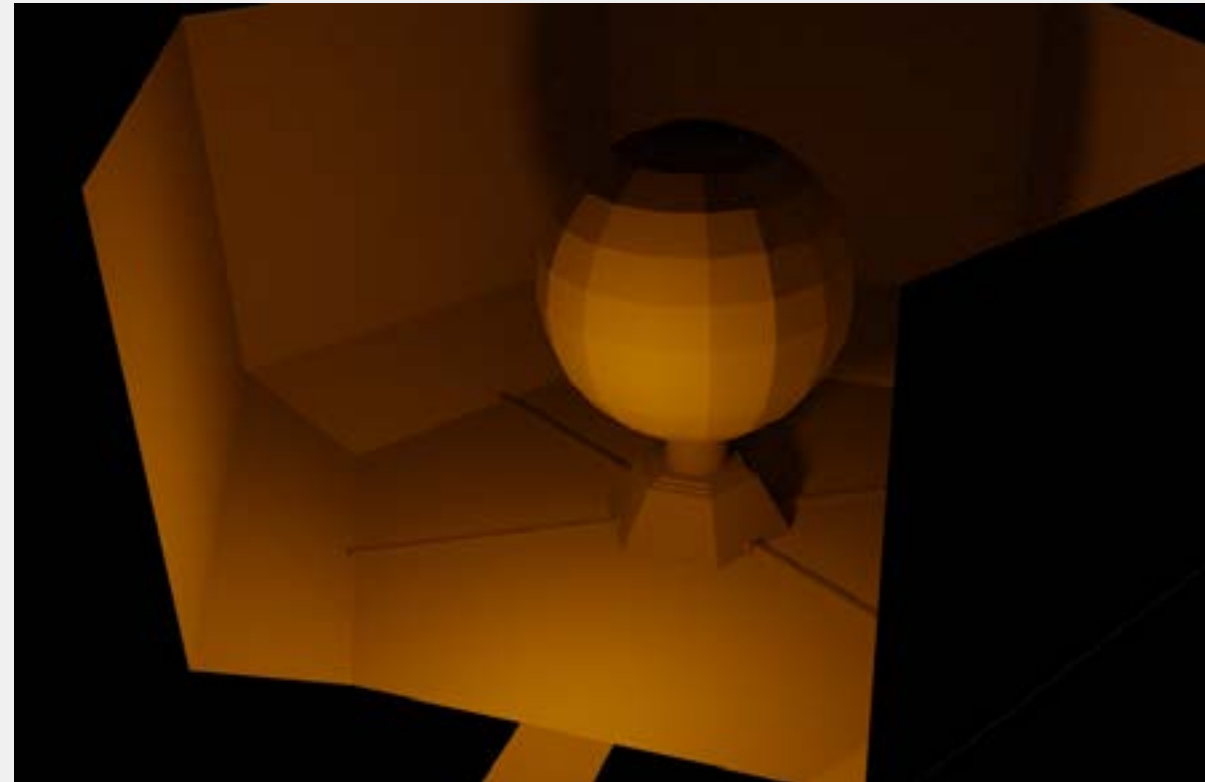
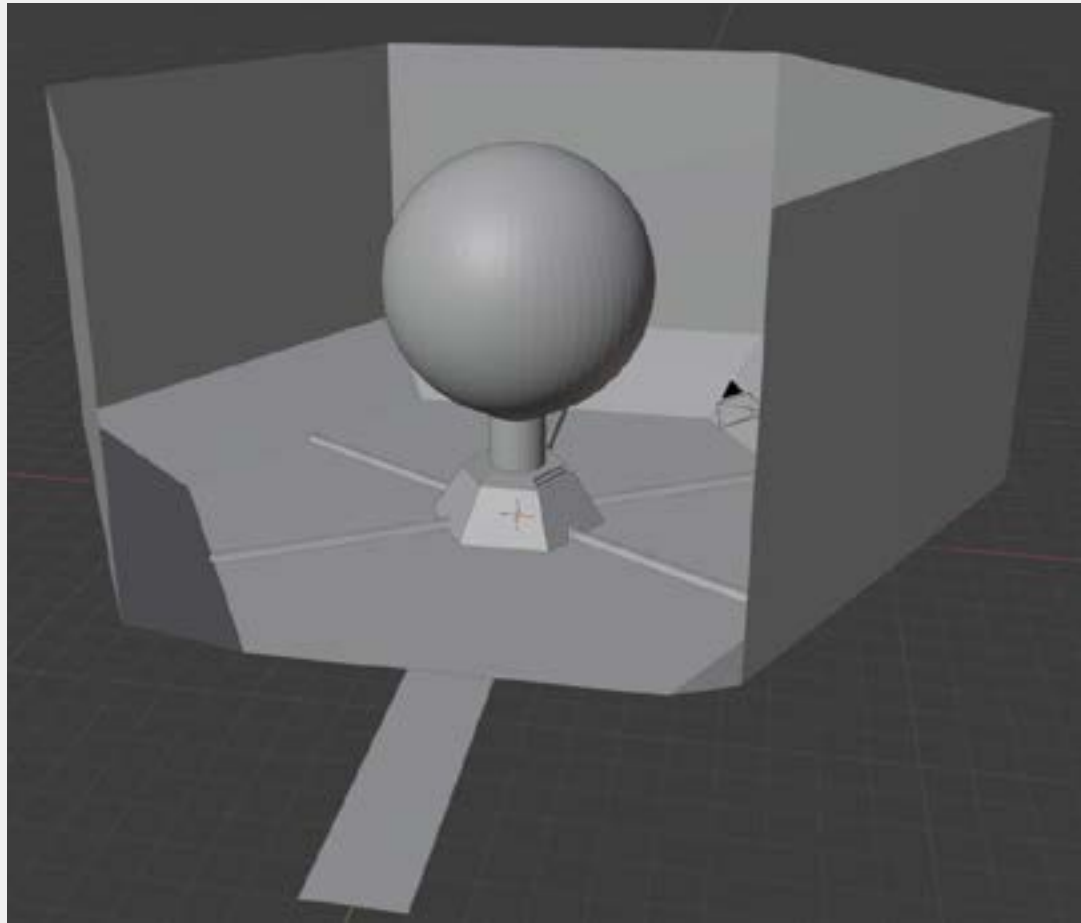
### - Aluminium and brass metal sheets.

These came in different thicknesses ranging from 0.008 to 0.064 inches. I thought these could work well for the triangle panels seen in the concept art, but it turns out it might be hard to drill through as it would peel through on the other side.

### - Flexible mirror boards.

These could work well for giving the illusion of space in the AI's chamber.



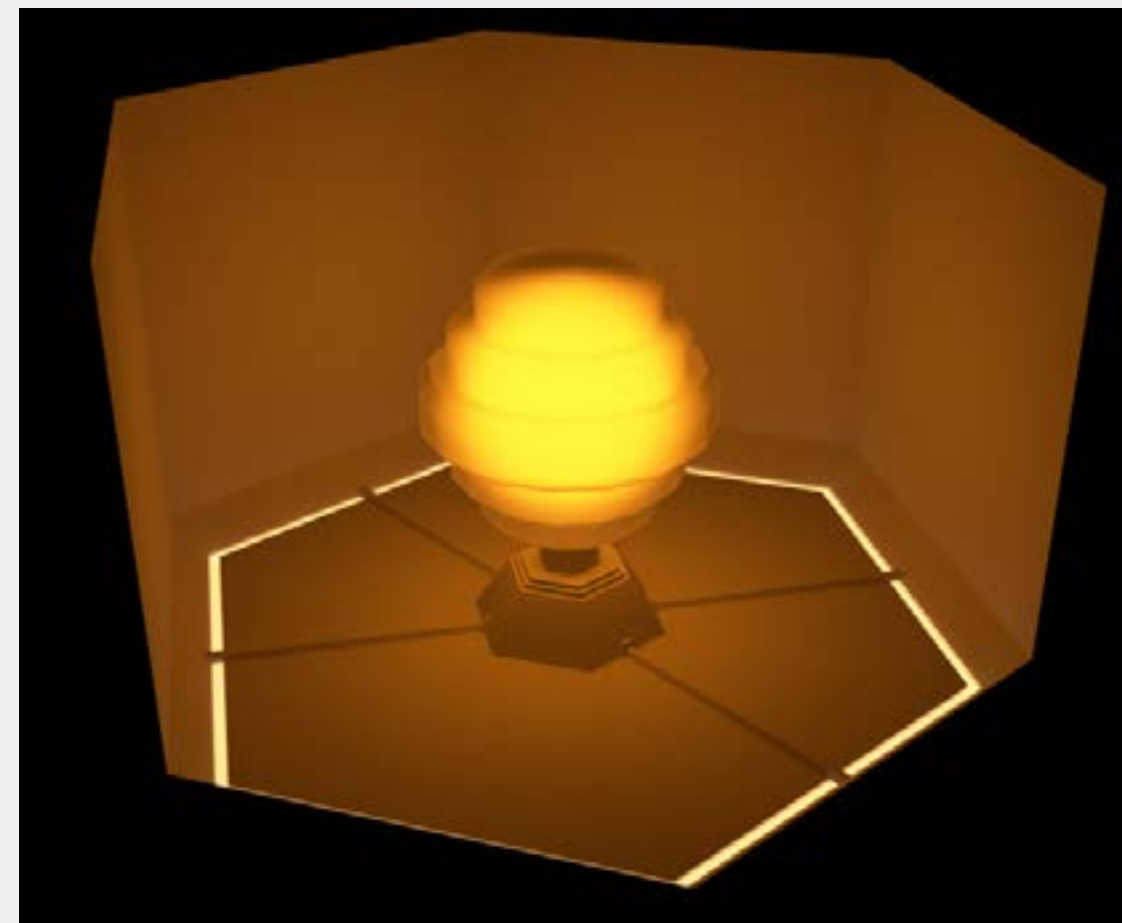
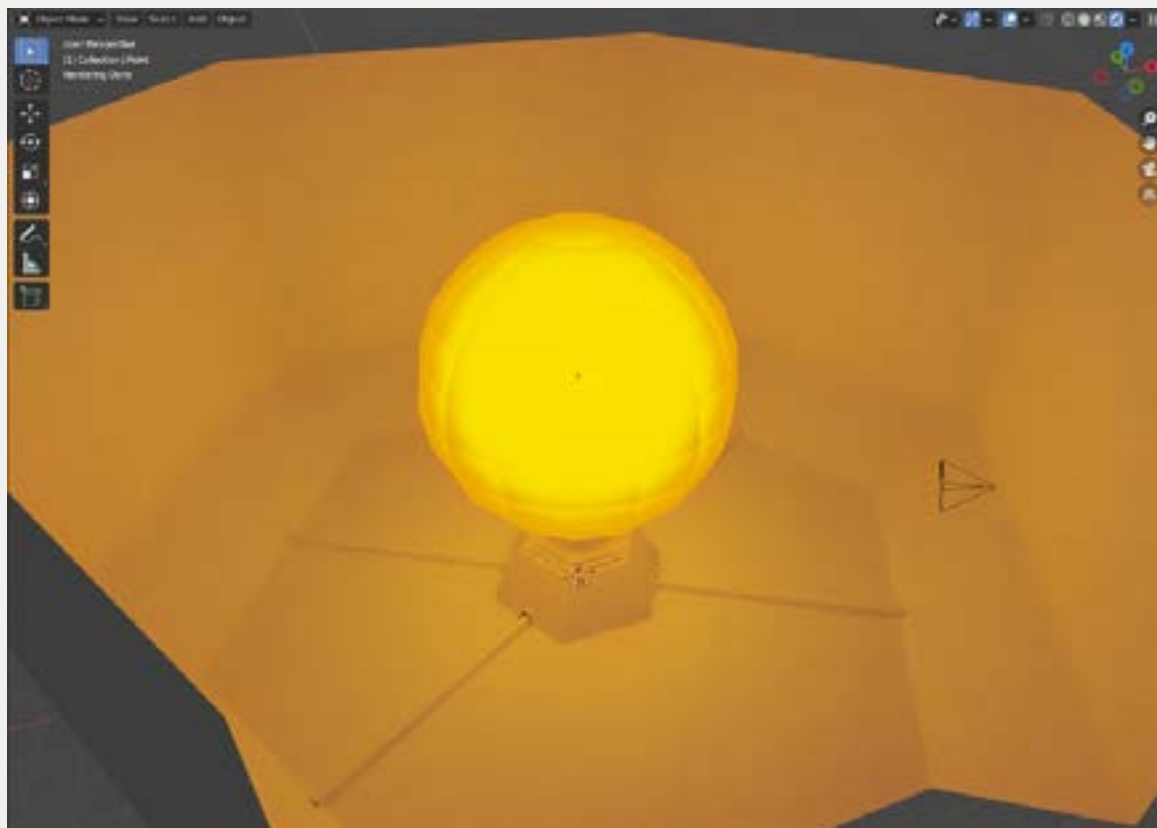


## Assignment 2: Concepts and Testing Blender Tests

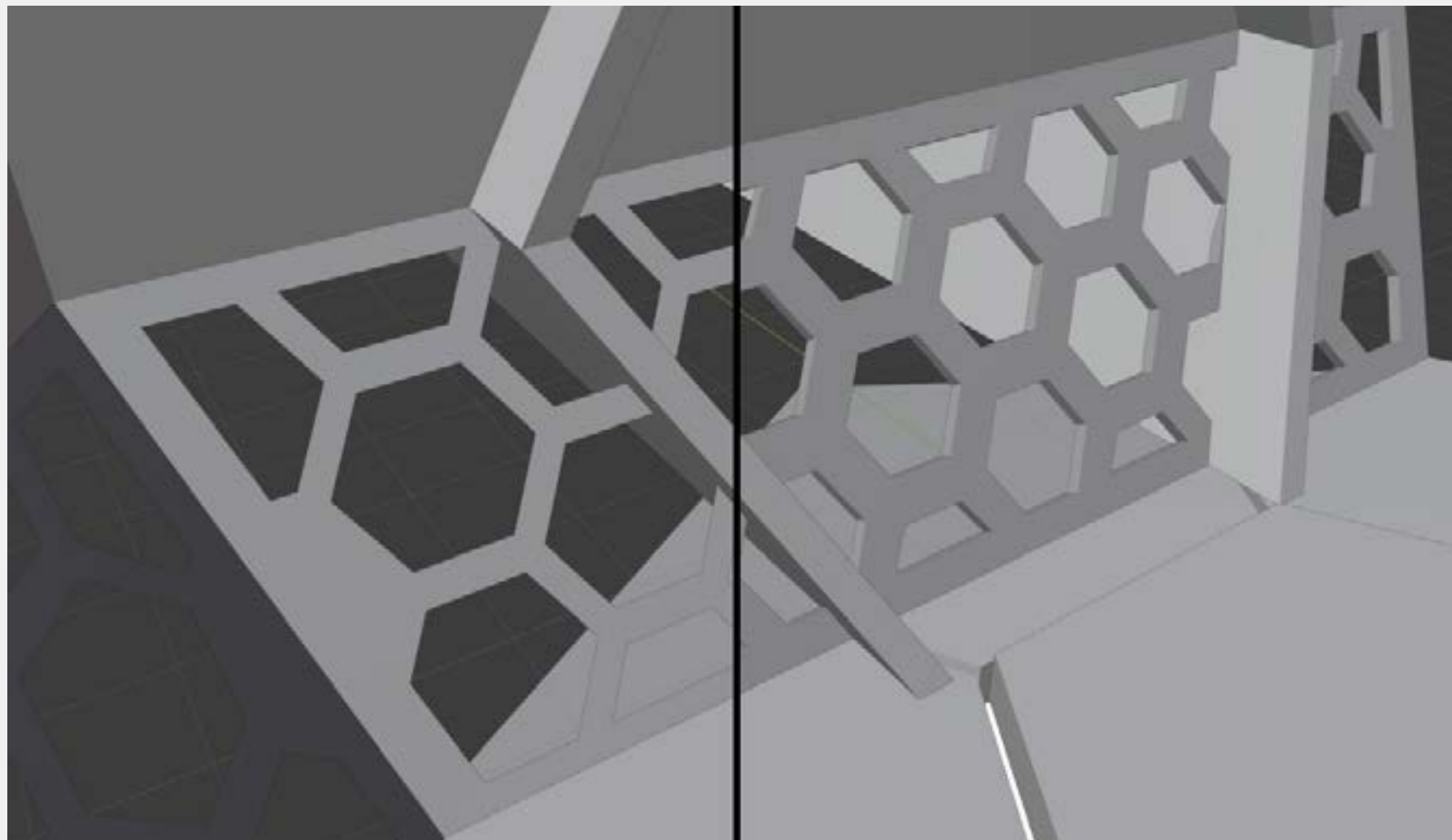
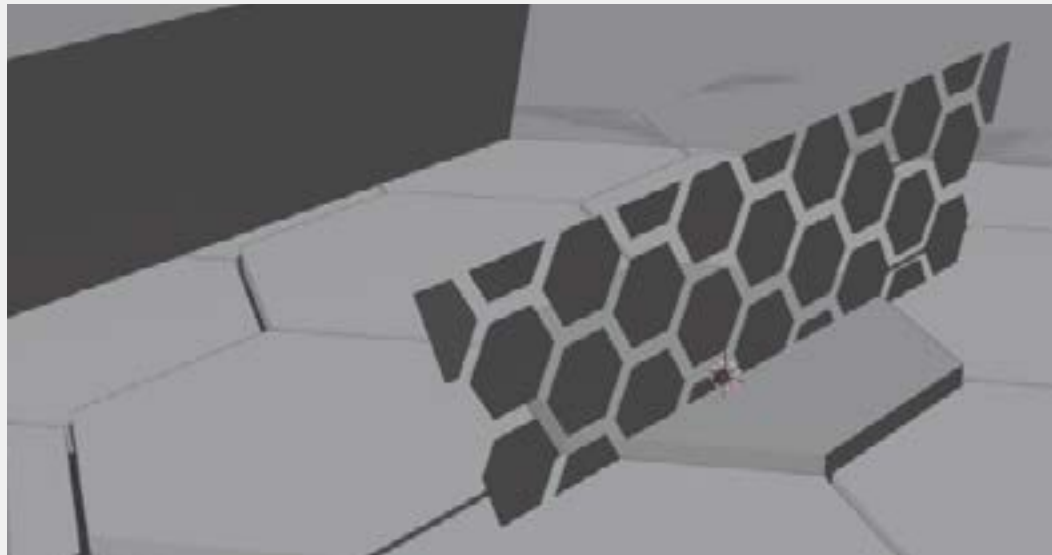
I'd been using Autodesk Maya since July 2017, but getting to grips with Blender was a new experience. The fact that it's free - among other reasons - is what hooked me in, and it looks like it will be a useful tool going forward.

To get the basic layout and structure of the chamber set up, I started with simple shapes (most notably seen in the top-left).

I opted to use the RenderMan engine mainly because I've used it since 2017, so I'm familiar with the basic stuff. The difference can be seen in the bottom images, with an early Cycles render on the left and a more recent RenderMan render on the right. Of course, this is by no means a comparison of the quality of the engine itself.







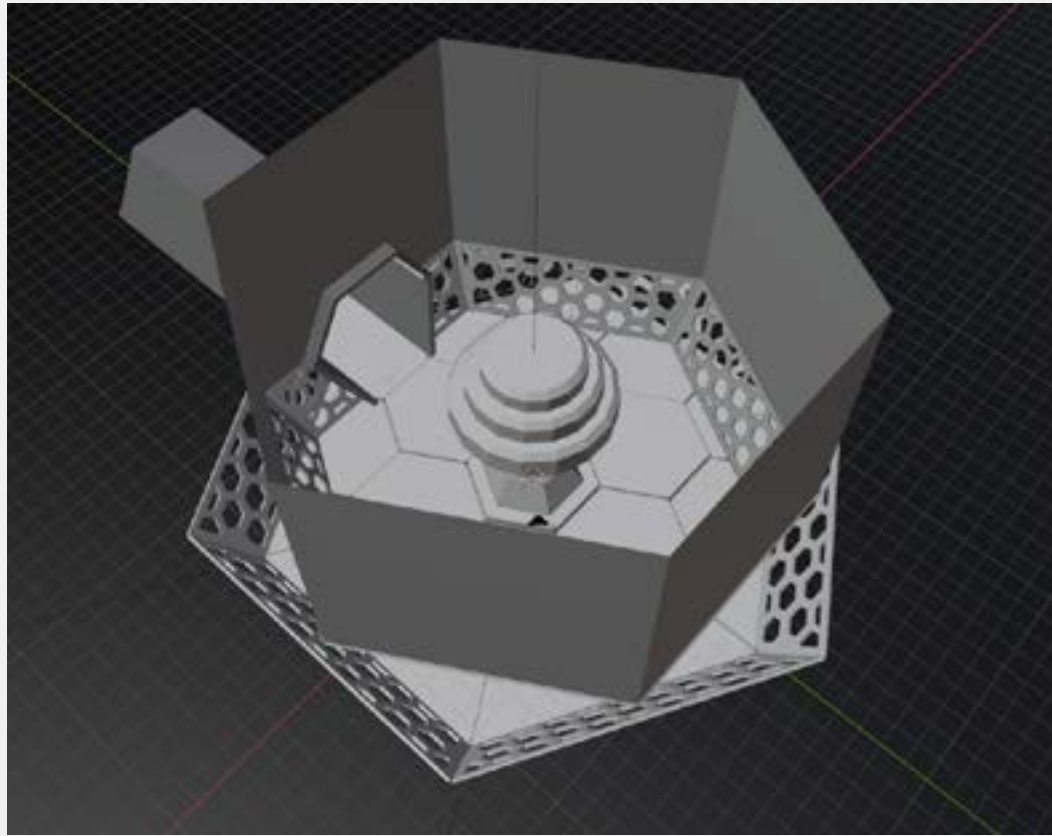
## Assignment 2: Concepts and Testing Challenges and Modifications

One of the hardest parts of modelling the artefact was creating the cage-mesh thing that surrounded the main area. I started by creating a simple quad plane and snapped the vertices to the existing wall that I created for reference. Then I set the pivot point to the bottom edge and rotated it until it was vertical (about 30 degrees).

I created a simple cylinder and changed the sides to 6 for a hexagon (something I did a lot for this model). Then I duplicated and arranged them in a pattern. After that I applied a boolean modifier which basically “cookie-cuttered” the pattern out of the plane. Finally I just reset the plane rotation and voila!

I realised that the cage looked a bit flimsy, so with a bit of fiddling with confusing settings, I managed to scale the hexagon cutouts from their individual centers, rather than the center of the object. Then when I noticed that the plane was still just a 2D plane, I simply extruded the faces.

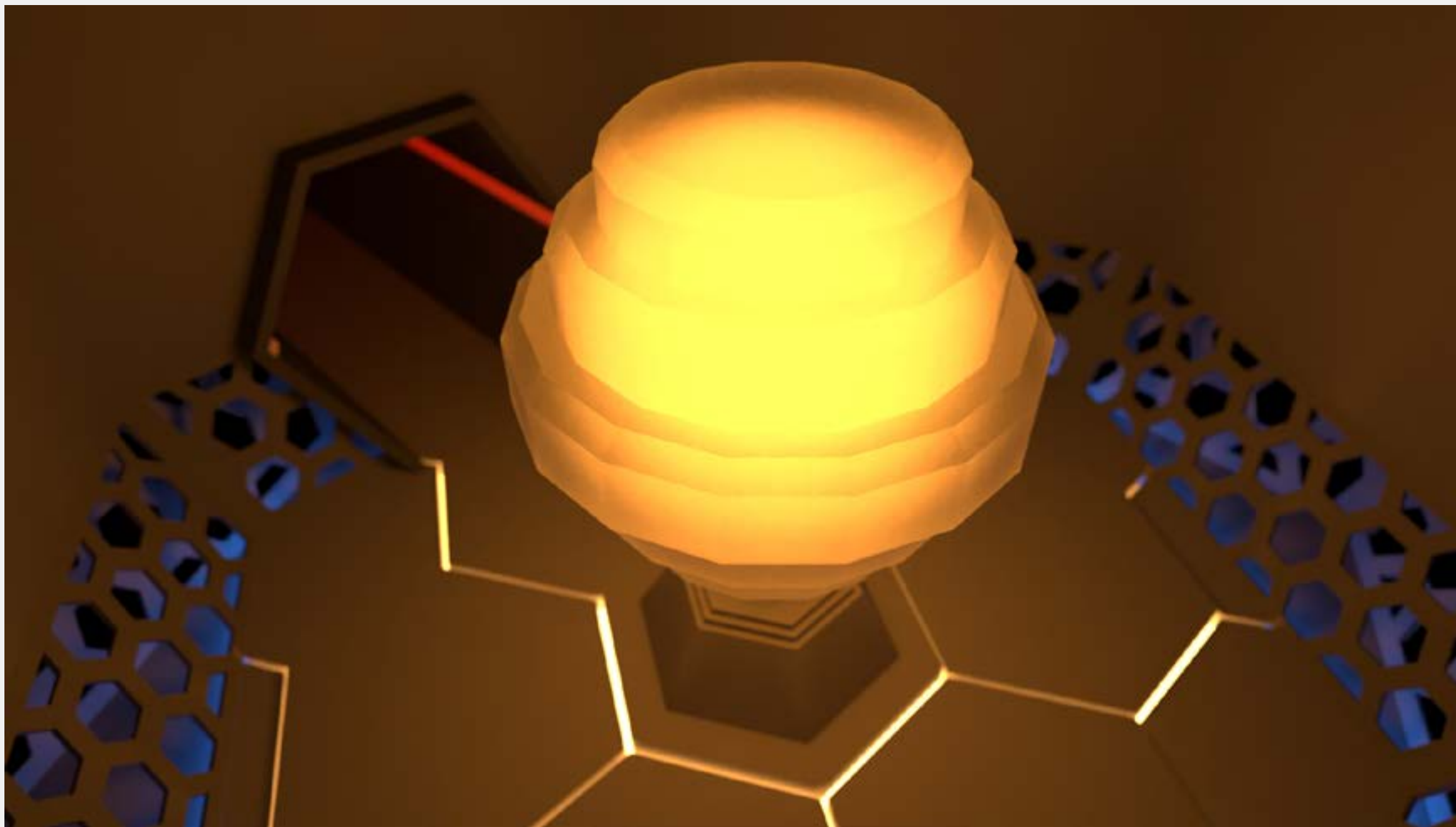




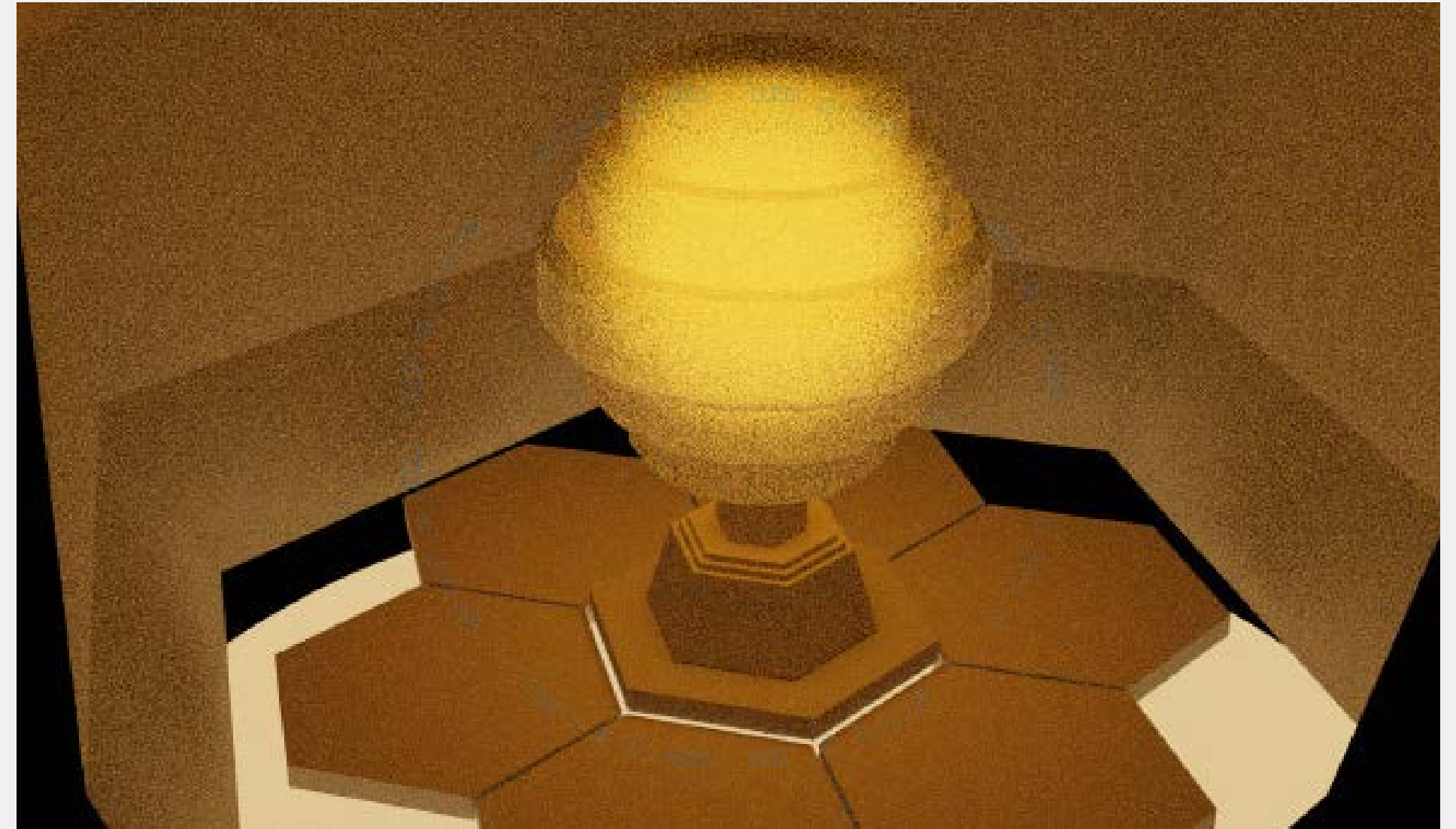
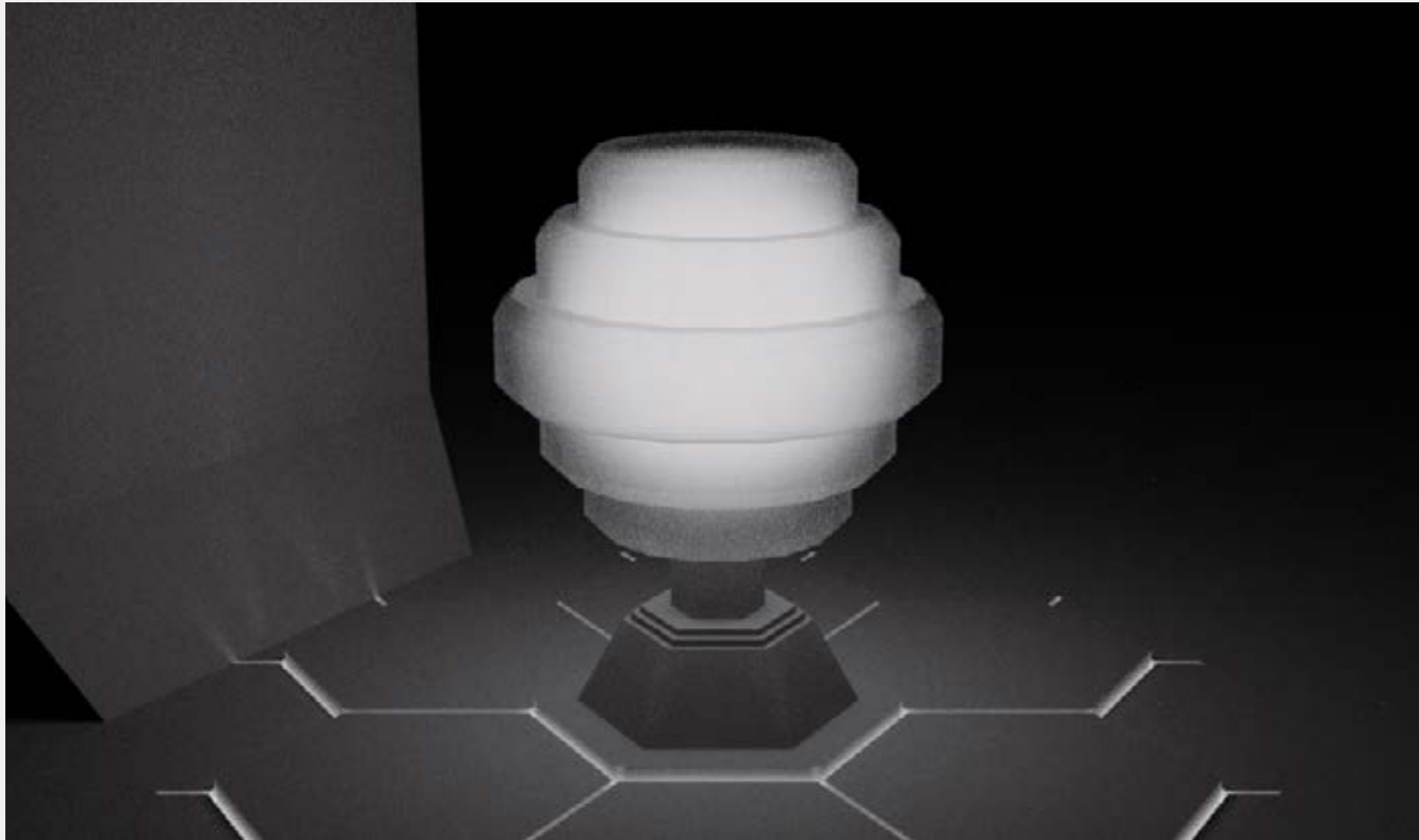
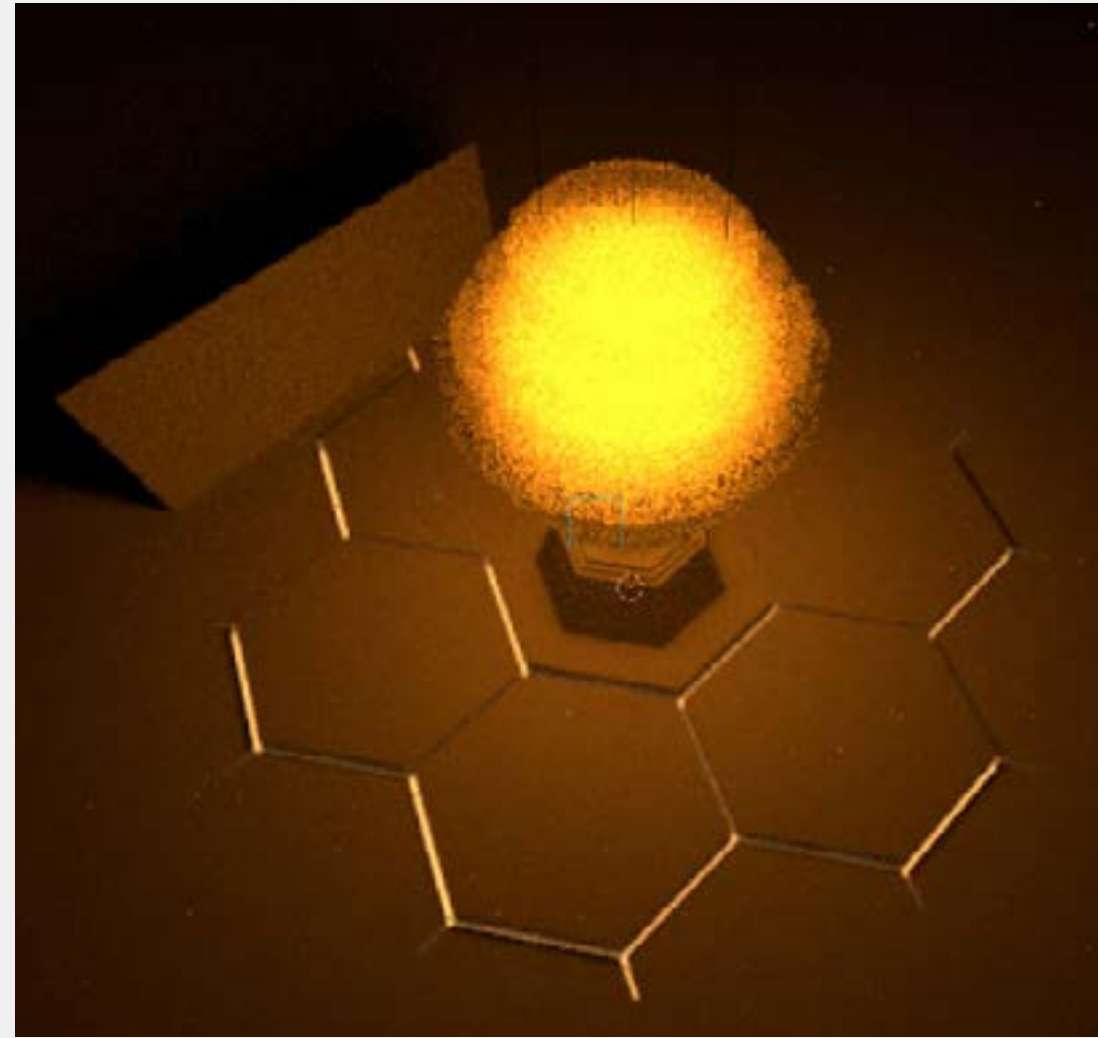
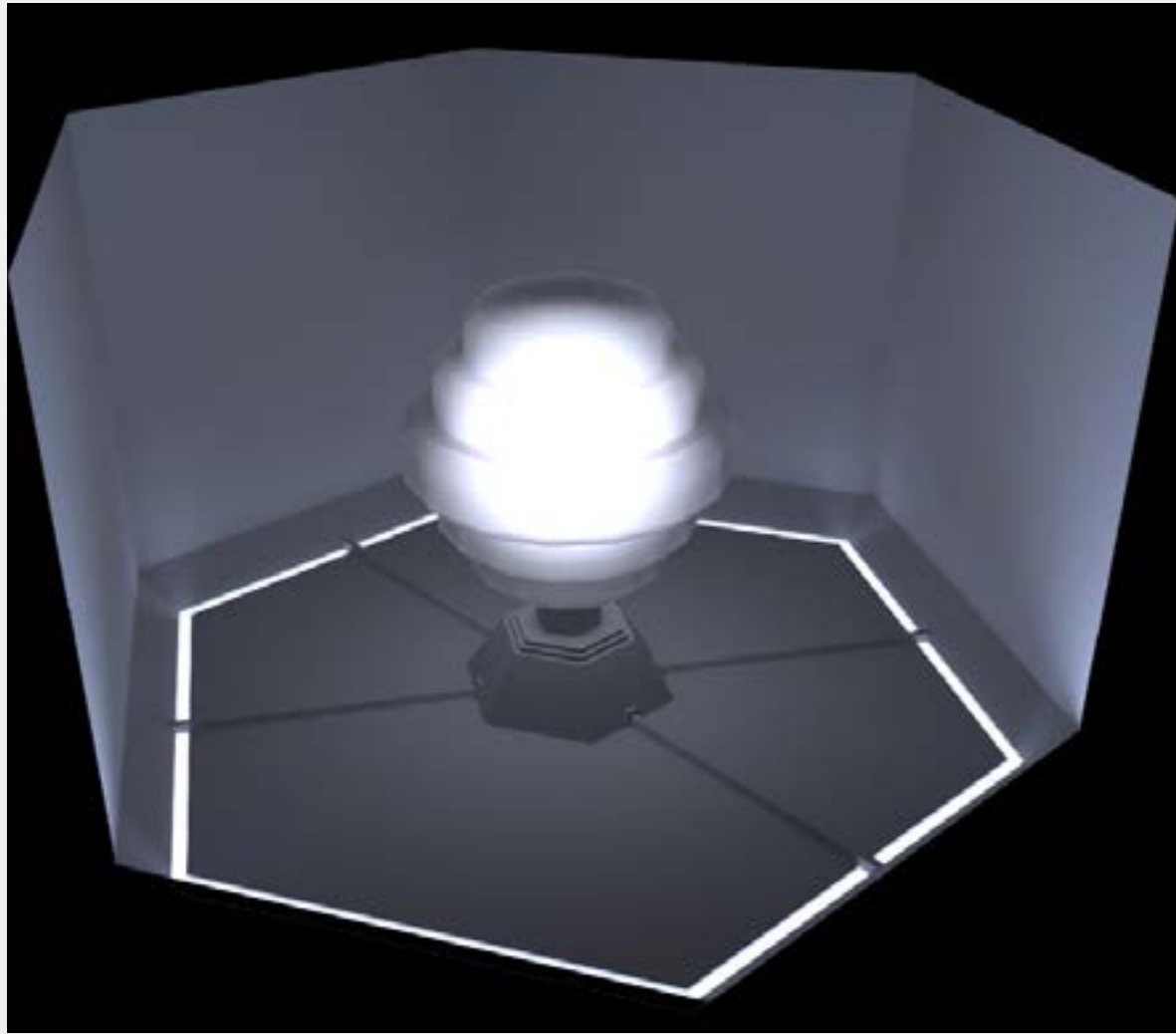
## Assignment 2: Concepts and Testing Final Model, Render and Evaluation

Pictured are images of the final model as it appears in the Blender viewport and when rendered with RenderMan 24.1.

I'd say that all 3 of my criteria were met here. The hexagon pattern on the floor with the light coming through almost creates a circuit-like effect spreading out from the core. The abundant use of hexagons makes the chamber look sturdy, and finally, the second cage surrounding the inner one gives the impression that there's more to explore, which is further supported by the contrasting blue lights in the lower level.















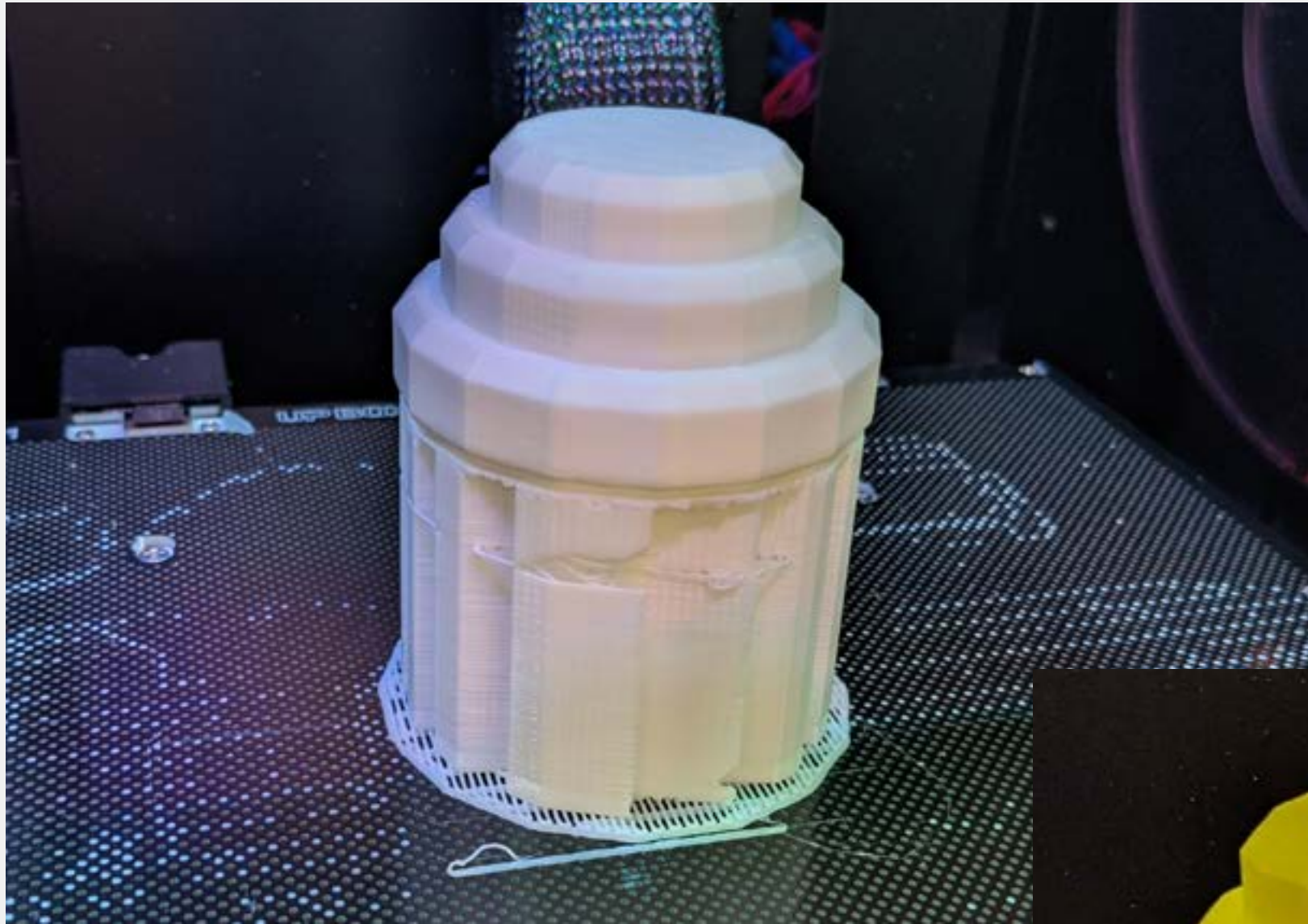
### Assignment 3: Final Build Lasercutting

The materials used here were 4.75mm medium density fibreboard (MDF), 3mm MDF and 2mm clear cast acrylic.

It's a fairly straightforward process that I'm well familiar with at this point.

The components are scattered across multiple Illustrator files. Some stuff might be missing, but most of it's there.



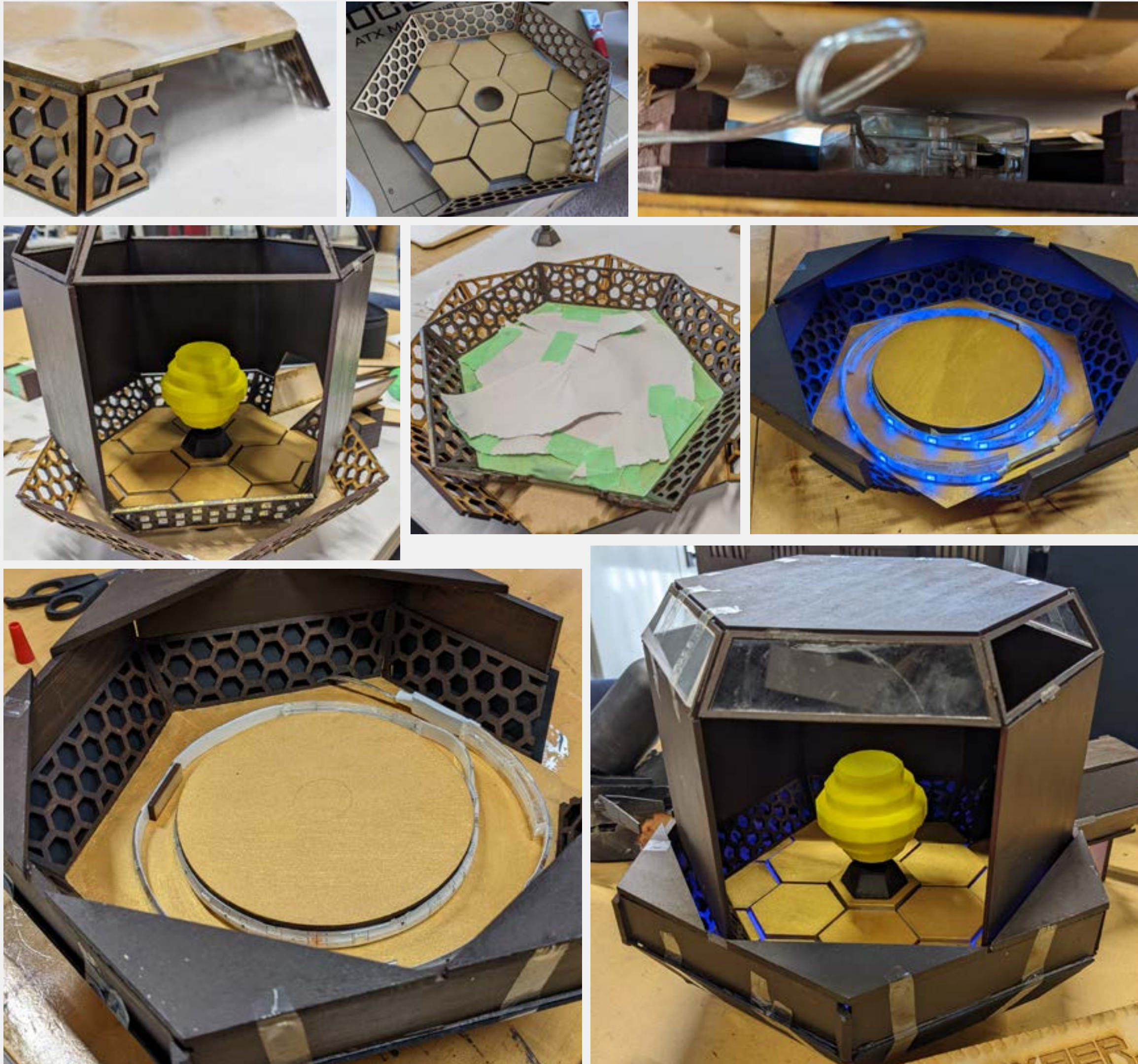


### Assignment 3: Final Build 3D Printing

Getting the measurements and scaling right for 3D printing was harder than lasercutting and I'd barely done any of it before.

I had to make the hive piece a solid object which was painted yellow, due to "difficulties" surrounding lighting.





### Assignment 3: Final Build Putting it Together

Superglue was used to hold everything together. I noticed other students using epoxy resin, which I think is supposed to be a stronger substance, but I never got the time to look into it, and superglue seemed to do the job well enough.

The only appropriate lighting I managed to find, all things considered, was an RGB light strip. I wrapped this around the center column of the lower deck, as well as a few pieces that were spread out. The logic behind this is that the strip was longer than the circumference of the column, and it would be a waste for it to obstruct itself. Additionally, this fix allowed more light to show. I hastily taped some black card to the outside of the lower deck to keep the blue light in.

The battery unit for the light strip is housed in a simple compartment under the artefact, which has the added bonus of elevating it for effect.

I contemplated whether to glue the sixth wall panel on, leave it off, or use a hinge to make it open up when needed. I chose to leave it off to keep things tidy and to allow easy viewing of the artefact.

The main section of the artefact can be easily lifted from the base; the use of hexagons means there's only one way for it to sit, yada yada yada.

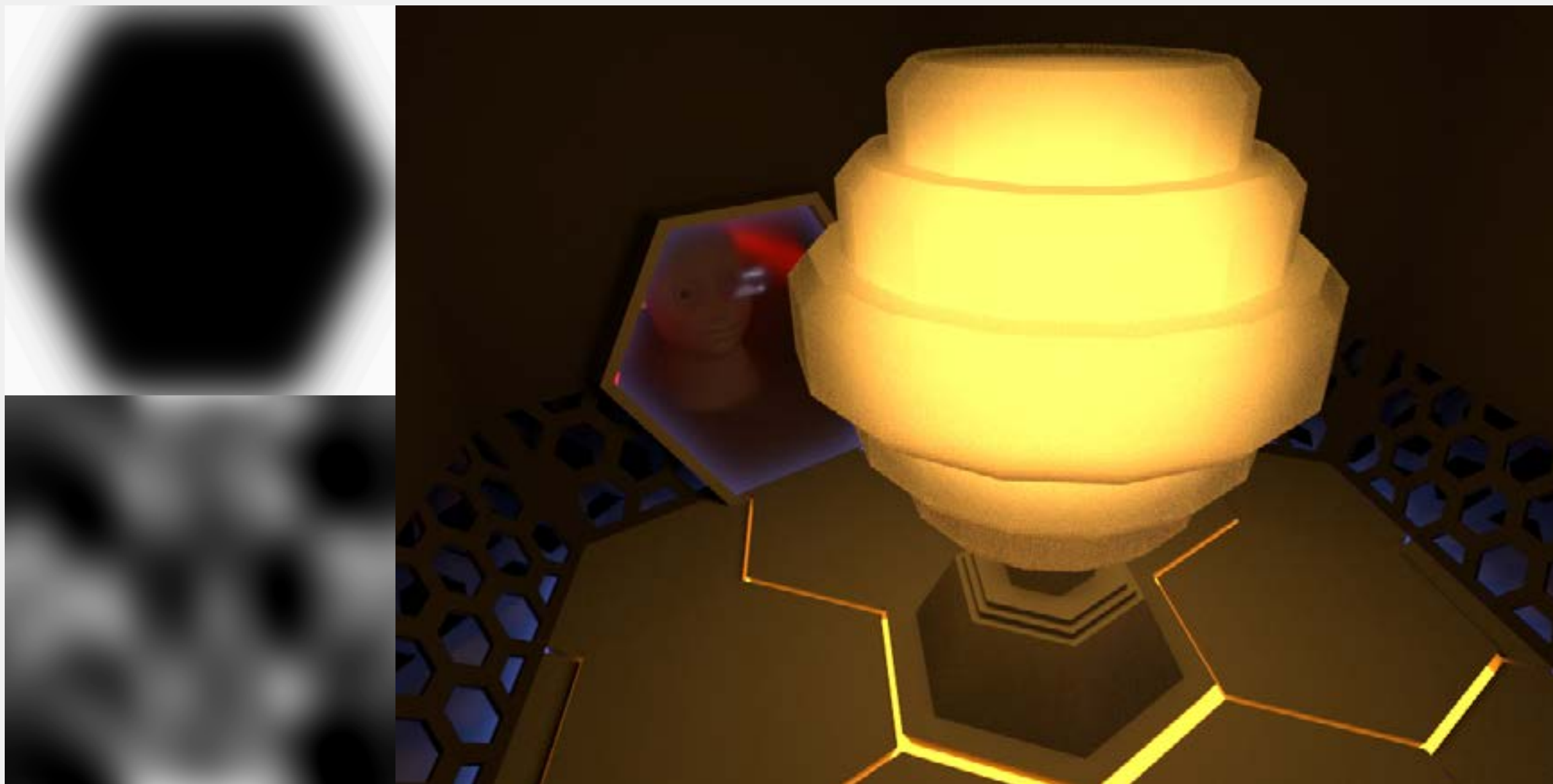
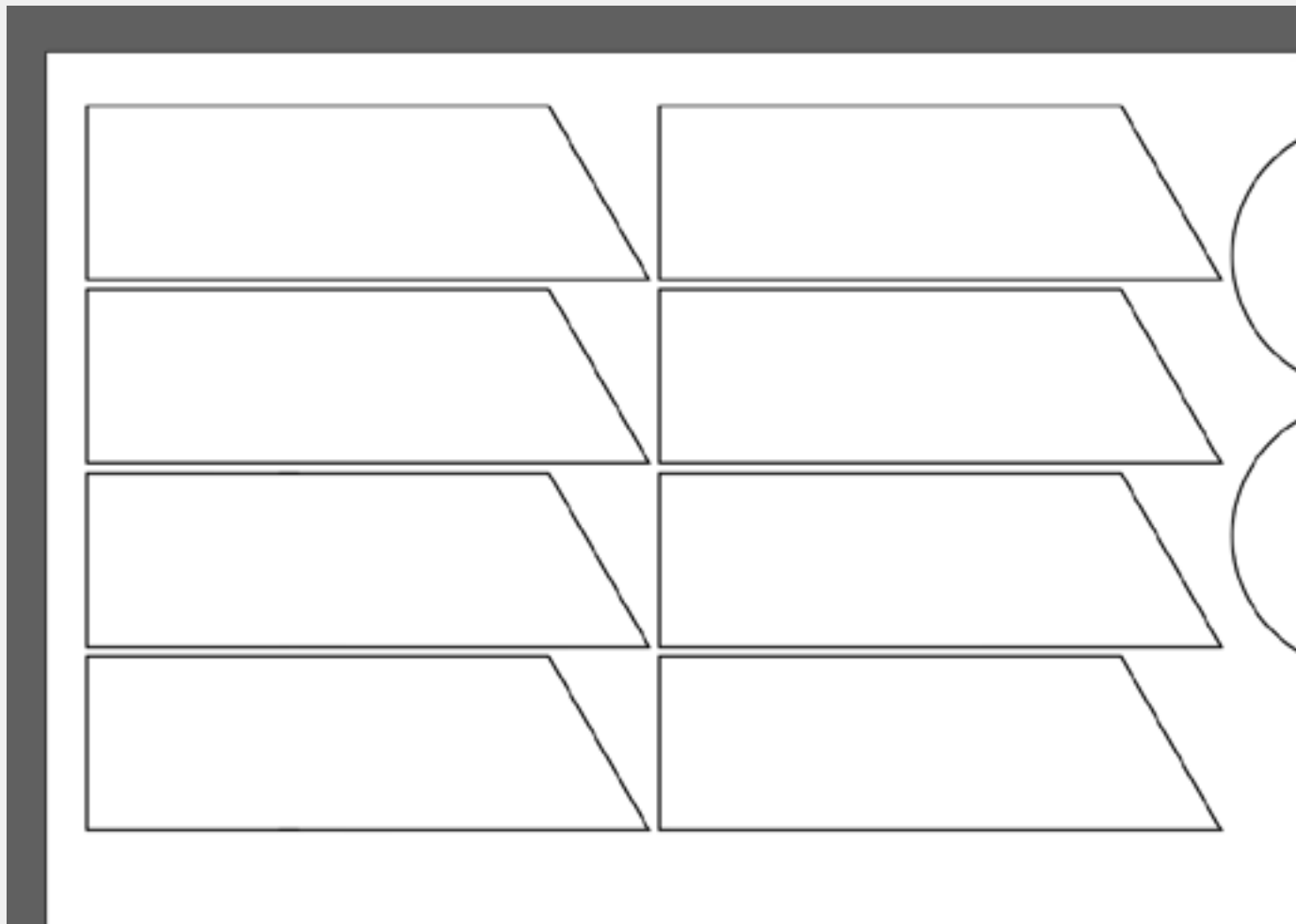


### Assignment 3: Final Build

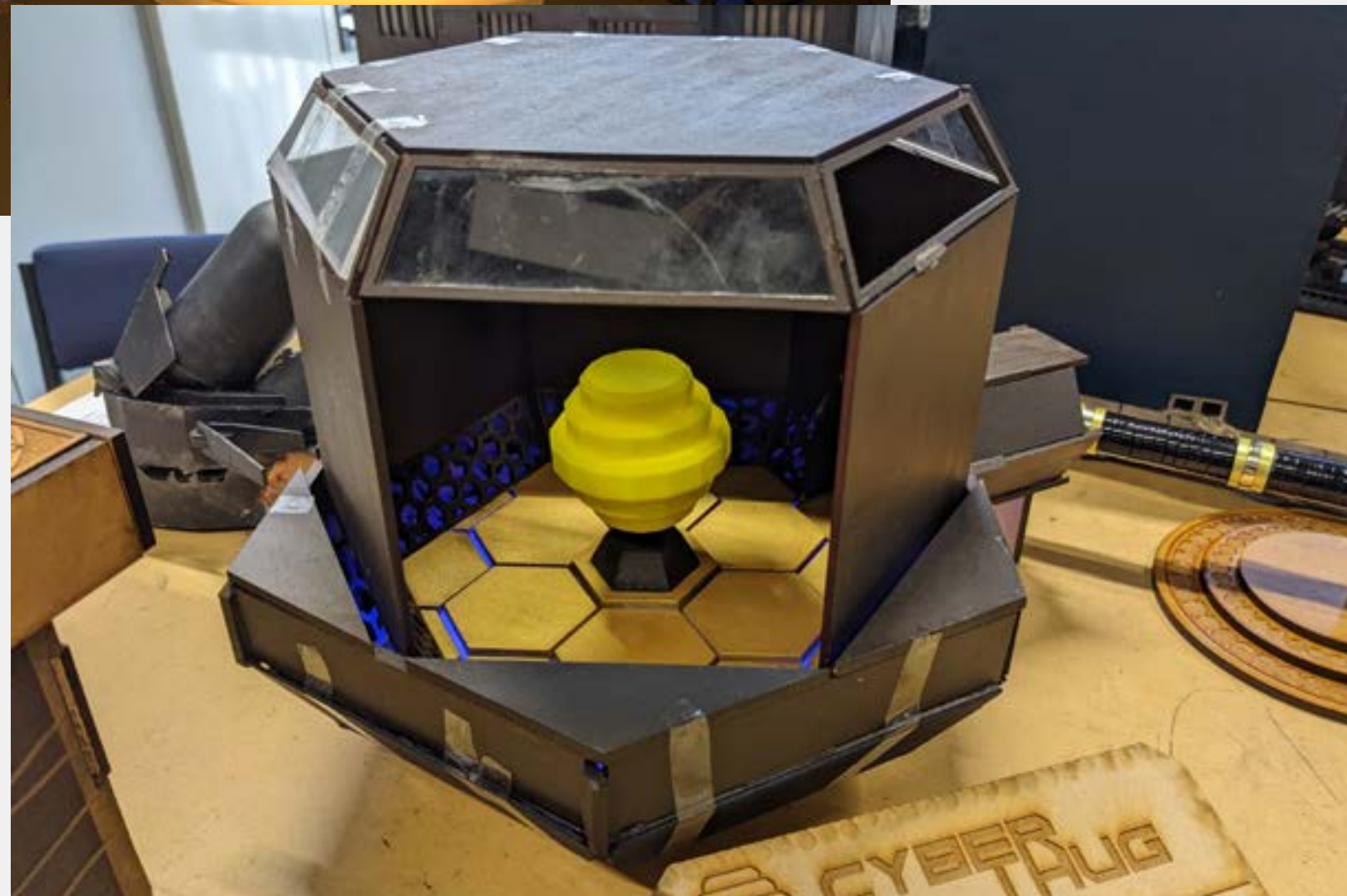
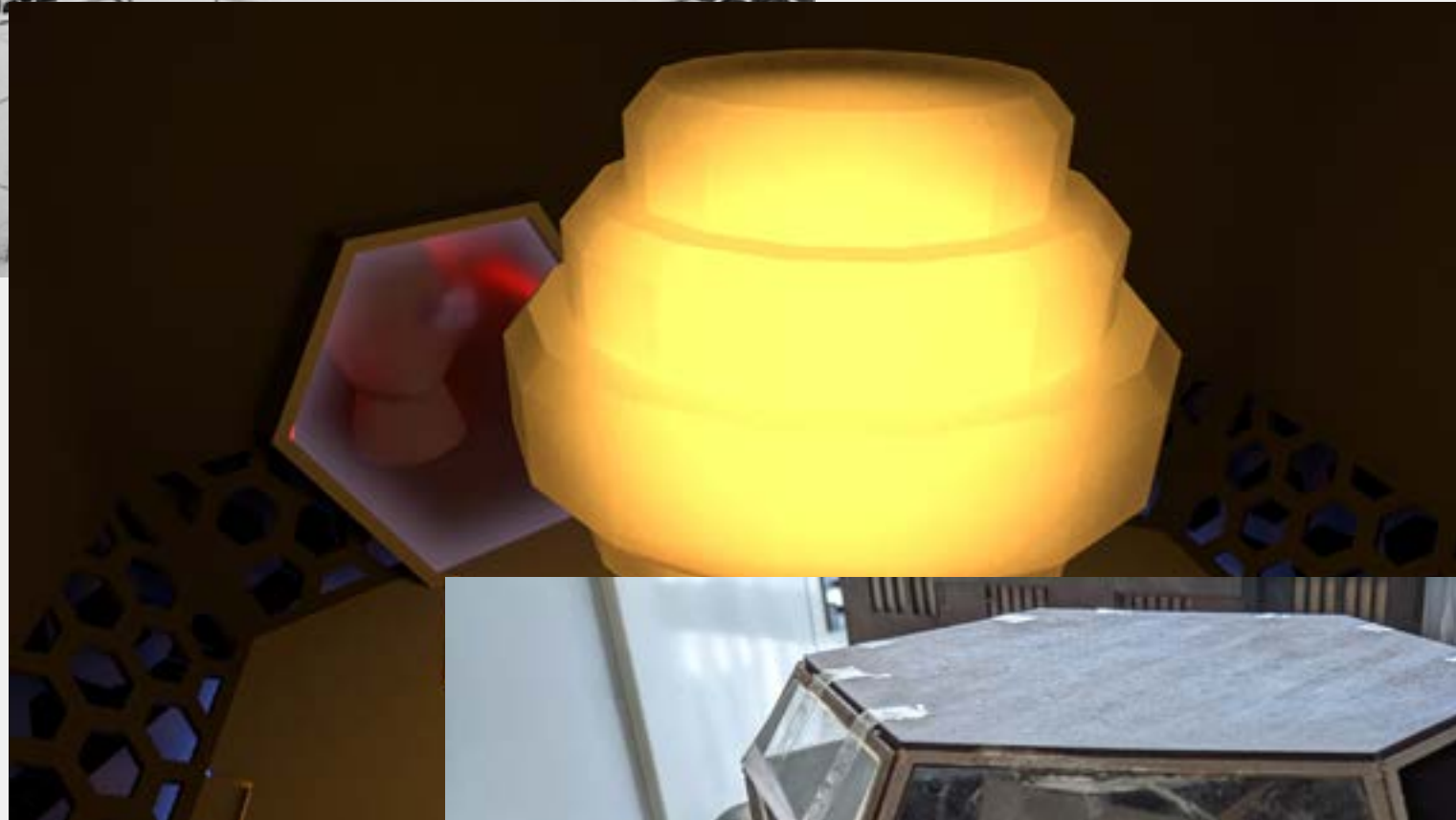
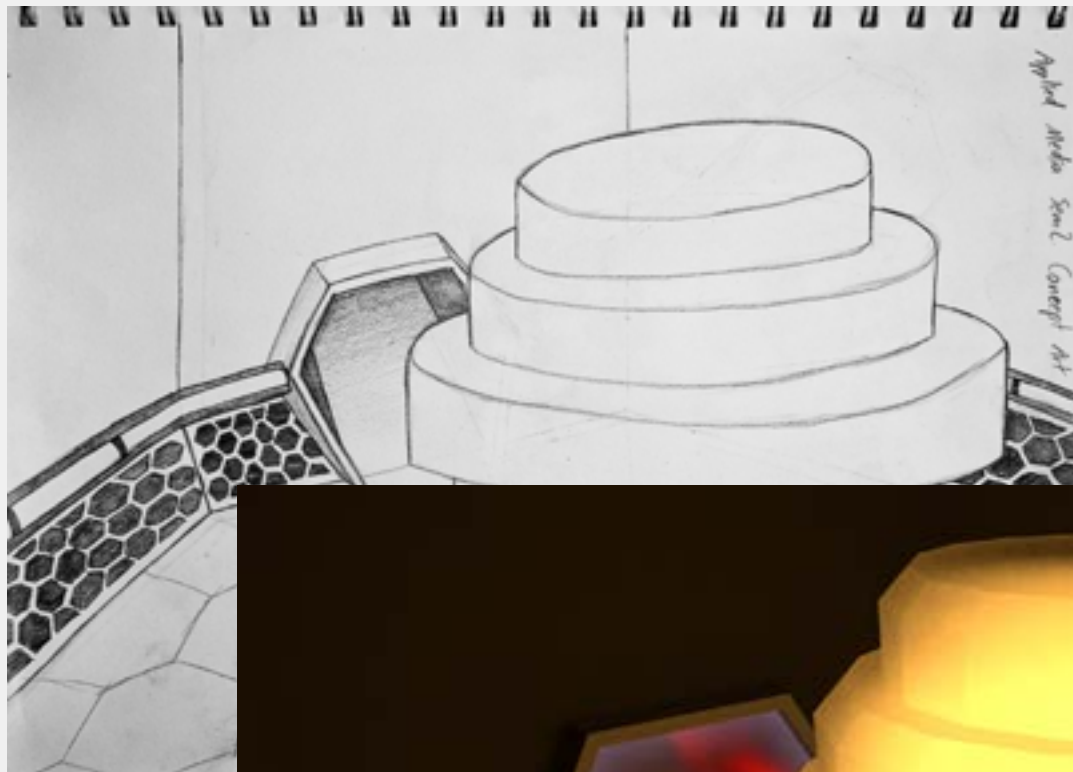
## Challenges and Modifications

I had trouble figuring out how to support the cage pieces while glueing them together, so I lasercut a bunch of pieces that matched the same 30 degree angle.

The walls were made a dark brown to draw more attention to the center of the chamber, and a forcefield was added to protect the core. In a CGI environment, the effects were acheived by strategic use of diffuse and roughness maps to simulate particles.







### Assignment 3: Final Build Evaluation

Overall, I'm mostly satisfied with how this artefact turned out. It was fun taking it from a conceptual drawing, to testing out the measurements and stuff in a 3D environment, to physically bringing it to existence.

If I had more time, I would've replaced the tape used on the card and windows with superglue so it doesn't look as messy, and added some polyfiller to the gaps to make it stronger instead of leftover MDF. It would've been nice to have the hive section lit, but that was unrealistic.