

VR Lunar City

Congratulations for being chosen to be a NASA HUNCH Finalist for Design and Prototyping. Know that there were a lot of very good teams with great ideas competing for these spaces. Being a Finalist means you are already a winner. There is not a 1st, 2nd, or 3rd place—there are only Finalists. Although HUNCH would like to have all of these projects turned into flight hardware, most won't make it that far. However, some of these ideas may inspire other hardware and equipment. This is like real engineering where any of the projects or ideas in a project that are deemed valuable to NASA could be incorporated into another project. NASA has no intention of taking or stealing ideas. HUNCH has every intention to keep your names attached to those projects so that you and your team retain credit for your ideas and efforts. In general, NASA does not seek patents on space hardware unless there is a use for it on the ground that could be valuable.

Suggestions for the Final Design Review

Houston in the middle of April is warm and humid. The building is air conditioned but there will be lots of people. Rain is possible.

- Look professional.
- Everyone on the team should plan to talk.
- Update your brochure with you latest prototype and information.
- Make sure your QR code works for everyone.
- Update your tri-fold with your latest information—less about early concepts, more about features.
- The better your model looks, the less you have to say.
- Take a video of everything working well so if it fails when you arrive, you can still show functionality.
- You will be sharing a table with another team. Make sure your display will not take up more than half of a 6 ft x 2ft table. There will be some tables with power and some without. We will try to give priority to those who need it for the presentation—video.

Suggestions for VR Lunar City

- Make your video smooth and relatively slow so that people can follow the motions.
- Have your video on your computer, not pulling from the web—internet may be spotty.
- Start your video high above so they see the overall view and they can visualize where they will be going.
- Plan to talk through the video so people receive the personal conversation with the team not a recording.
- Change your views so that people are able to see more than a frontal view as they travel.
- Make sure the software you are using doesn't elongate the dimensions or exaggerate sizes.
- Label some of the equipment and pathways so it is easy to understand without discussion.
- If you use music, keep it low and not distracting.

About our project

We are tasked to create a virtual lunar city with the following constraints: a surrounding terrain, multi-national flag pole, 3 different landing sights, power, trash locations, a bone yard, lighting, and more. This all must be shown off in a four minute or less video.



Next Steps

- ★ Add more details
 - Craters
 - Rocks
 - More detailed boneyard and trash location
- ★ Add animated features
 - Working regolith plant
- ★ Interactive features
 - Moving rocks
 - Working doors
 - Working garage
 - Moveable waggon
 - Controllable vehicles

Lunar City Vr

Brooke Street

Connor Spillman

Skyler Tuggle

Teacher: Luis Reyes

School: Space Coast
Jr/Sr High School

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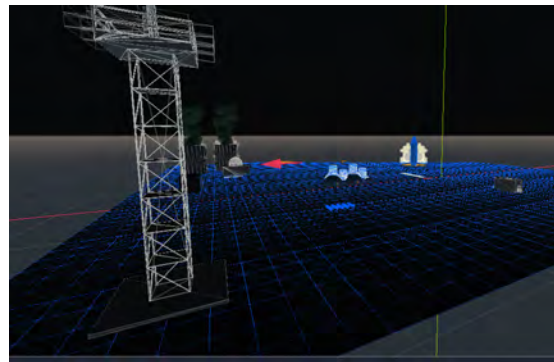
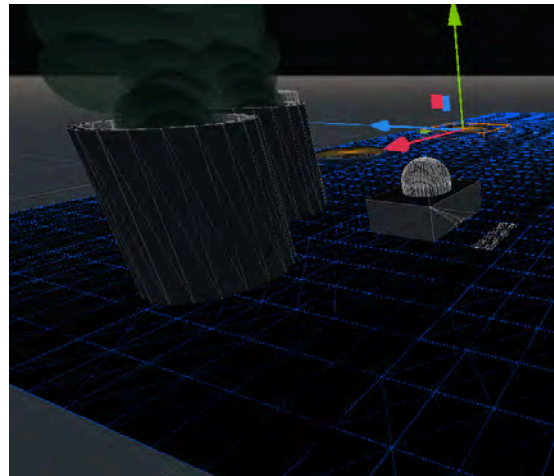
Our Group



Software- GoDot

- ★ First released in 2014
- ★ Lightweight engine, being less than 100MB.
- ★ Strong support system.
- ★ Cross platform game engine that is used for both 2D and 3D development
- ★ There are a variety of tools offered, including animation tools, animation tools, and code editor, and more.
- ★ Developers can use code in several different languages, GDScript is specifically for GoDot.

Skeleton of Our Project



Final Prototype

Not shown in the video:

- ★ Animated rocket takeoff
- ★ Solar panel farm
- ★ Inside of lunar habitat
- ★ Rover circling habitat



PROBLEM STATEMENT

By the mid to late 2020s, NASA wants astronauts on the moon. My team and I are building a Virtual Reality simulation of the lunar city base in order to sustain them.

By the mid to late 2020s, NASA wants astronauts on the moon to sustain the United States' leadership role in space exploration, while building a "Lunar City" for temporary or permanent residence on the moon so it can sustain life for extended periods of time. It also will be providing a refueling station for further space exploration to Mars, as 250,000 miles to the Moon compared to Mars' 140,000,000 is enormous, refueling during the journey will be required.

Key terms

Unity: An application or website that allows you to build anything in 3D or 2D.

Virtual Reality: A 3D place where you can immerse yourself into.

Oculus: A console that allows you to enter and interact with the Virtual Reality world.

Headset: The use of technology to allow you to immerse into the virtual world.

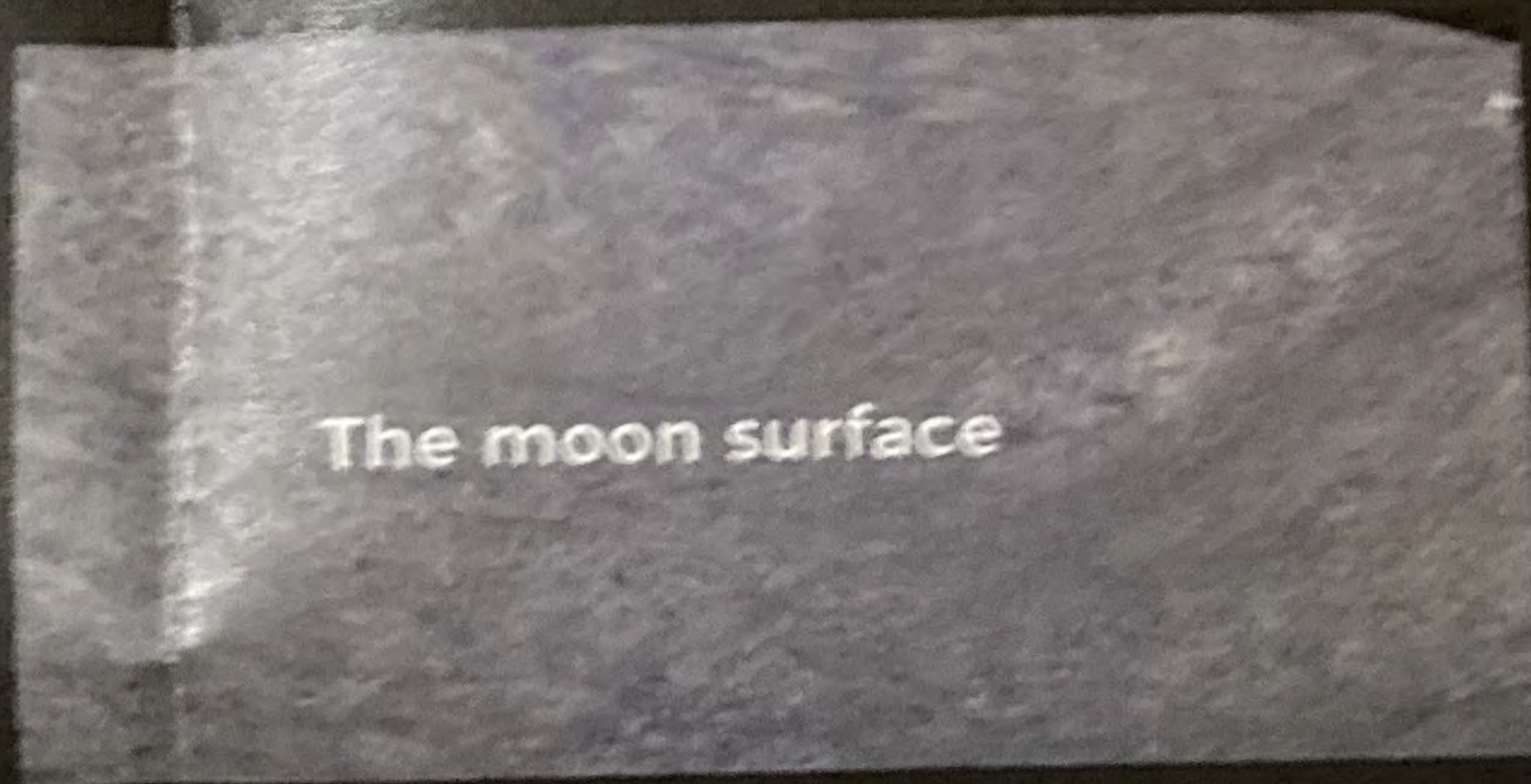
Shackleton Crater: A big hole on the south pole of the moon that has ice under, and the base will be nearby.

Computer: An electronic device used for storing and processing data.

On Shape: A place where you can create anything you want in 3D or 2D.

Hard Drive: Something you can store high

Moon base so far



The moon surface

Nuclear Reactor



CRITERIA/SOLUTION STATEMENT

Criteria

Virtual Reality World: The overall needs to look as life like as possible while still be functional.

Experience: were talking about how well and functional your experience or time viewing the world looks

Interactivity: how its interacting works so if you move somewhere, it will move the way you want it to move and not take 20 years

Development: we needed to figure out for our project what we were going to be building it on that's easy and understandable

Accessibility: we needed to make sure that our world wouldn't be to big and not be 40GB worth of storage

Assets and Models: we needed to make sure that it all fits Nasa understanding and view on the world at the assets look good and not choppy and bad.

Solution Statement

For our solution we are trying to find a way to manage and put everything around so that the astronauts will be able to extract ice from the Shackleton Crater with ways to manage it to bring it to base. It will also have the place to live, where the communication tower, and where everything else is going to go. With our solution you'll be able to walk through and be able to see the lunar city and where things could go.



Cad Model of the Lunar city

James Turnage

Experience Clear creek independent school district full time August 2018- Present Educator and Mentor, Computer science teacher Highschool CTE teacher Software engineer June 2011- October 2014 Learning technology coach December 2021- July 2022 Skills : Learning Technology · Learning Management Systems · Customer Service · Teacher Training · Instructional Leadership · Instructional Coaching · Curriculum The classes I taught were:

AP Computer Science Principles (JavaScript)

Computer Maintenance (PC Pro & CompTIA A+)

Principles of Information Technology (IC3)

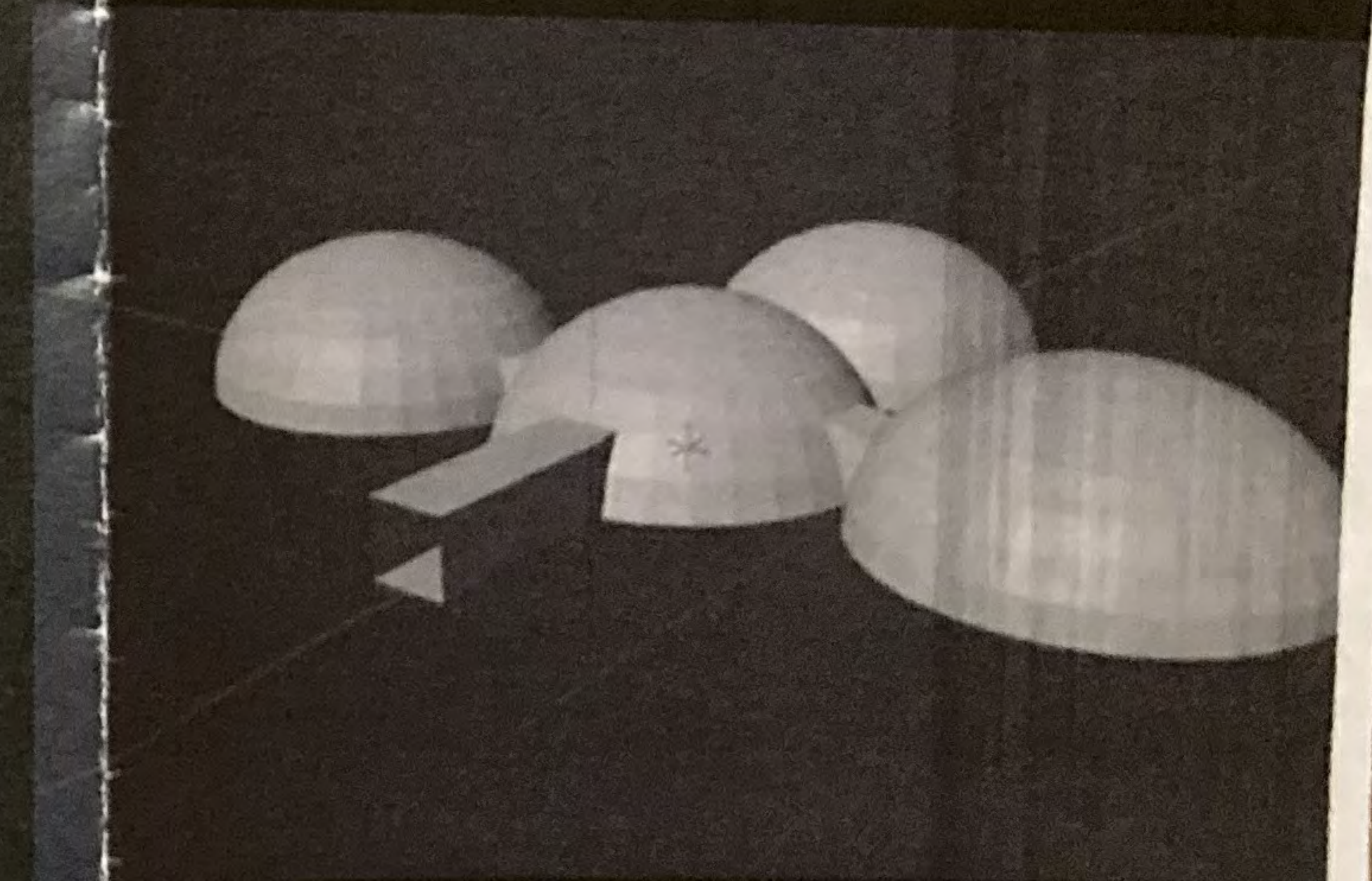
Principles of Arts, Audio/Visual Technology, & Communications High School Career & Technology Education (CTE) Educator. The classes I taught were: AP Computer Science Principles (JavaScript) Computer Maintenance (PC Pro & CompTIA A+) Principles of Information Technology (IC3)

Principles of Arts, Audio/Visual Technology, & Communication see mores software engineer June 2011- October 2014

LUNAR CITY

GET IN TOUCH

Clear Falls Highschool
Teacher: Mr. Curtis
Team: Trystan Jones
and Savannah Muller



The habitat we are to going to have on the moon

Problem statement

NASA astronauts require a secure living and working environment on the moon. The need for additional oxygen in the absence of atmospheric oxygen in space, and the need for all the research stations to be in close proximity to do effective research is very important. This is why we chose this project, to help the astronauts complete their mission safely and effectively.

The moon has natural dangers as it can be lethal without proper safety precautions due to its extreme temperatures, radiation, and other threats. Therefore, it is essential to establish safe spaces for astronauts to research and work for their time on the moon.



The Red Rocks

Golden High School. Mr. Swift's class



COMMUNICATION
SPECIALIST

Aiden Fellows
2127238@jeffcoschools.us



TECHNICAL
SPECIALIST

Marek Krajewski
2138492@jeffcoschools.us

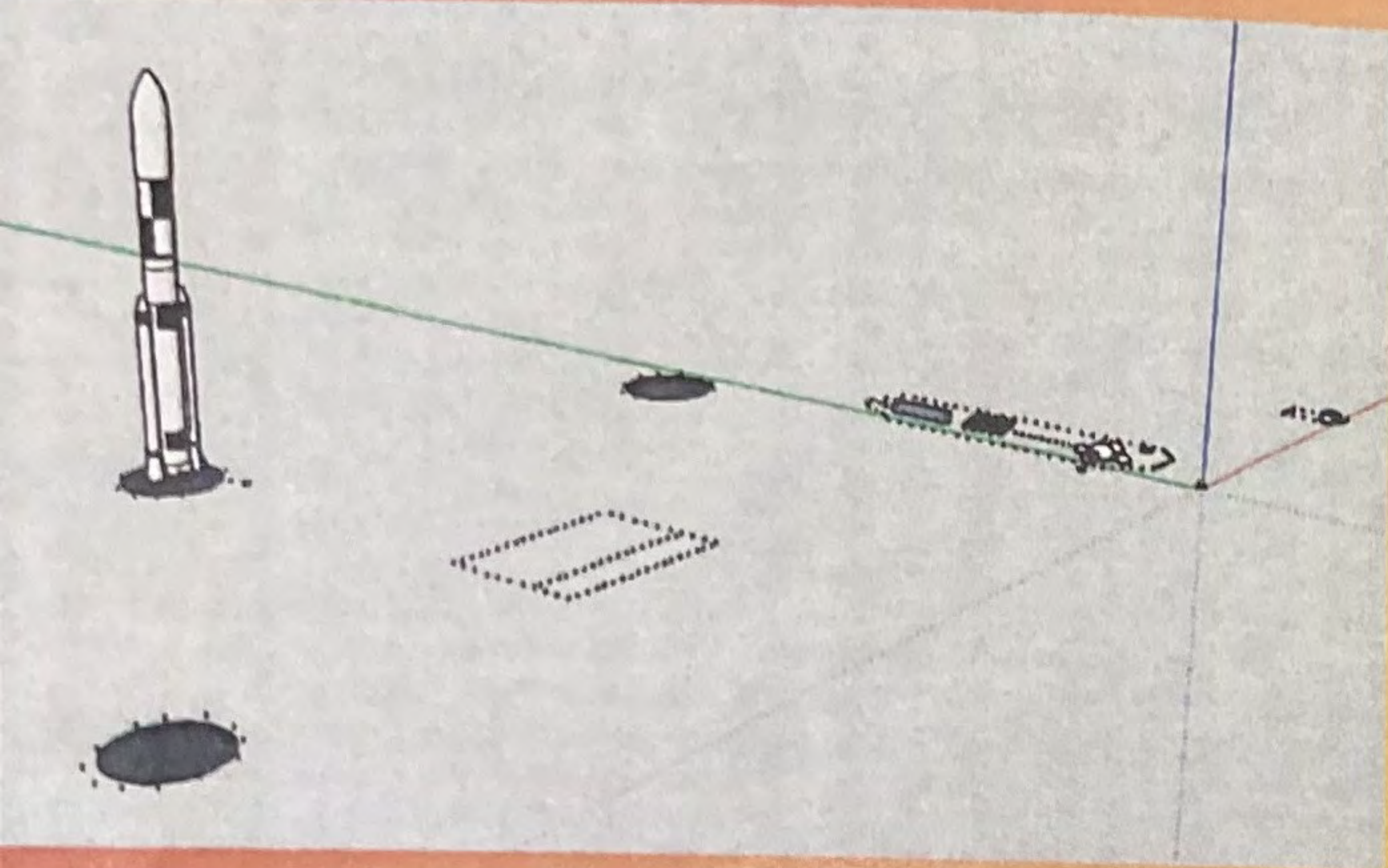
We are designing a virtual lunar city to help envision the layout of the real city. This will help the astronauts and other NASA designers create the city that we helped design for the greater good of space exploration.

Our purpose for this is to construct a city designed to have safety for astronauts and researchers. This environment will shield them from space hazards which will let them continue their research and help further space exploration.

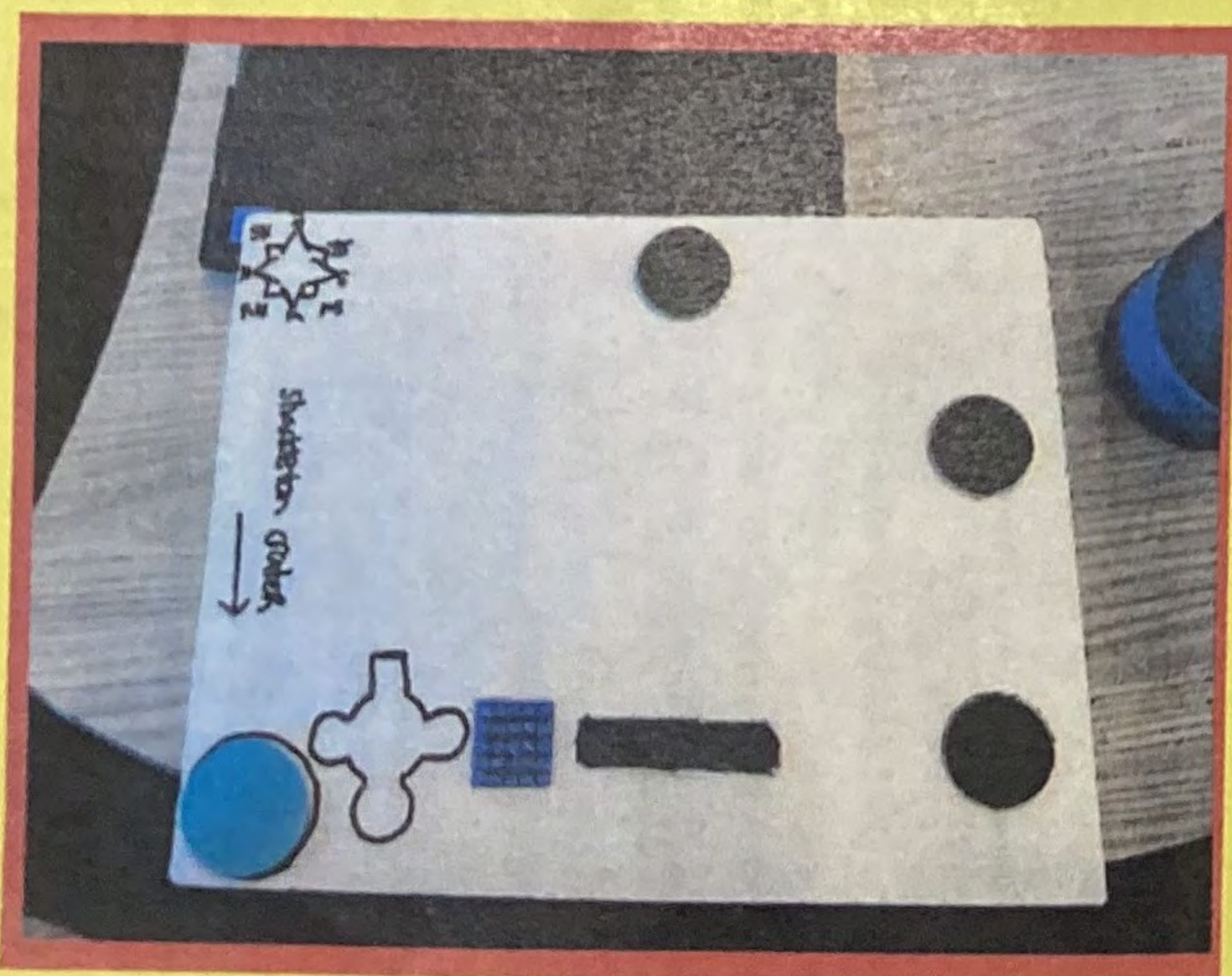
Explanation of solution

We chose to put locations where we put them to help the astronauts work efficiently and effectively in their daily activities. This will help the astronauts research and report discoveries about the moon.

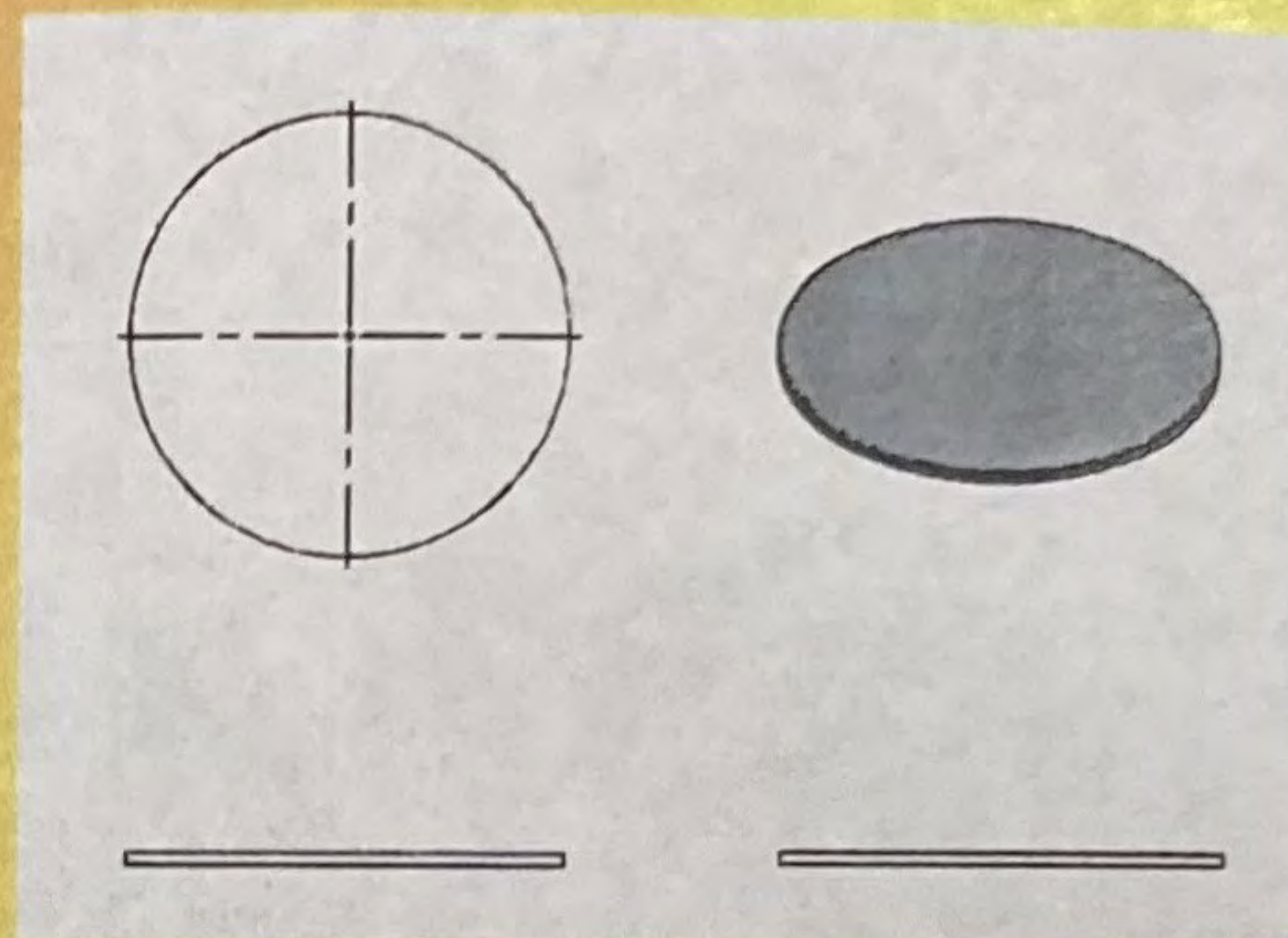
Onshape Drawings



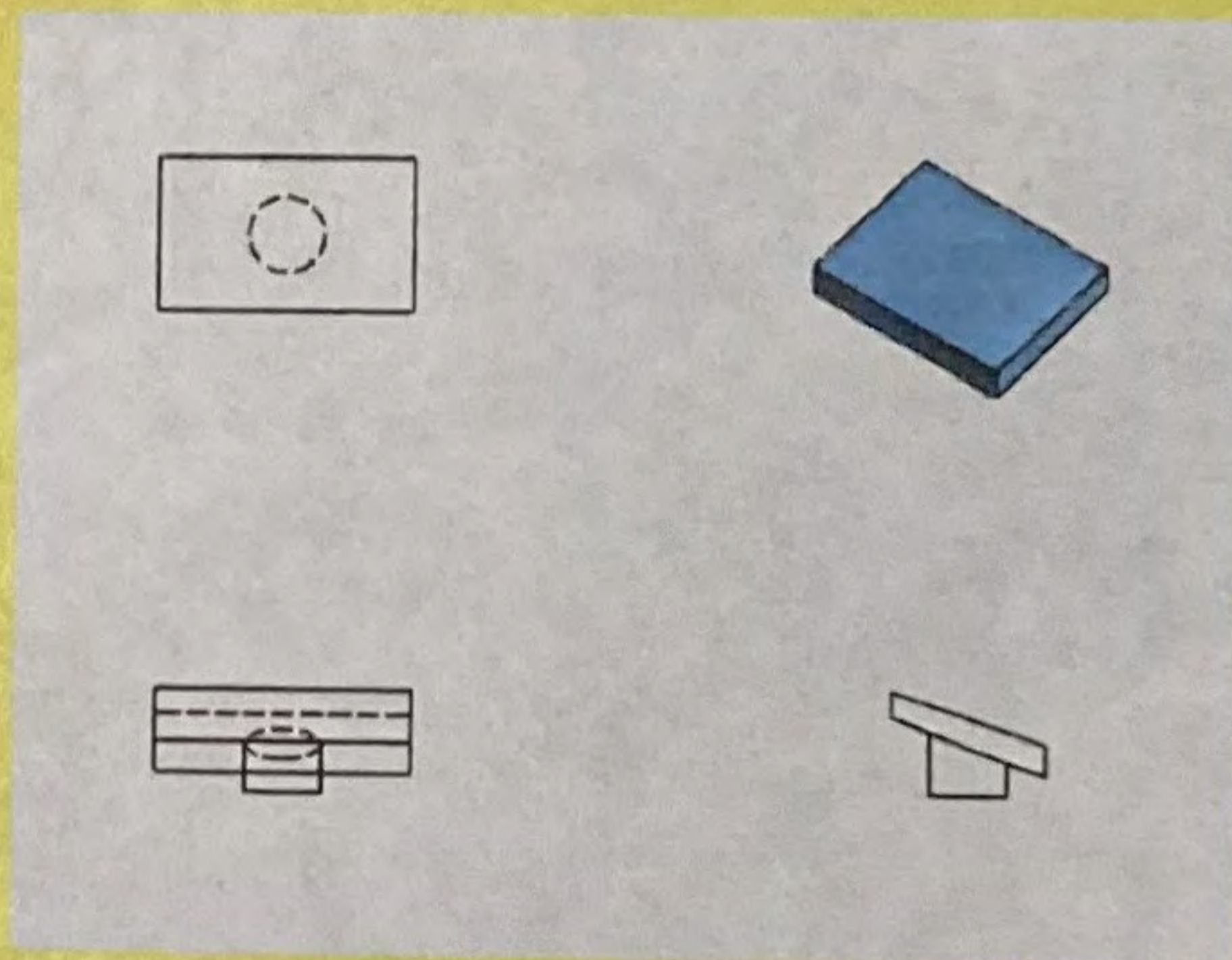
VR prototype for the lunar city.



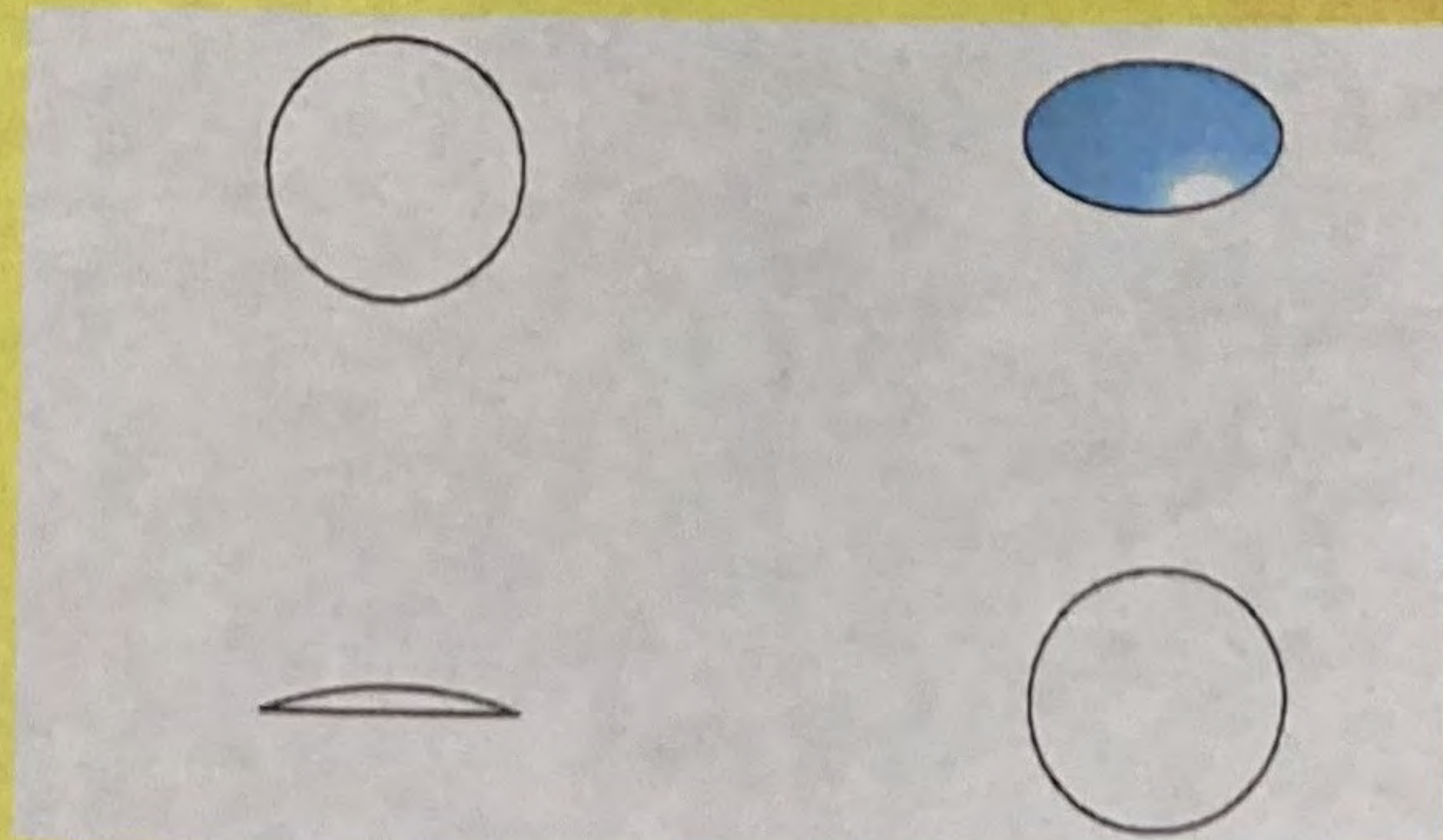
3D prototype for the lunar city.



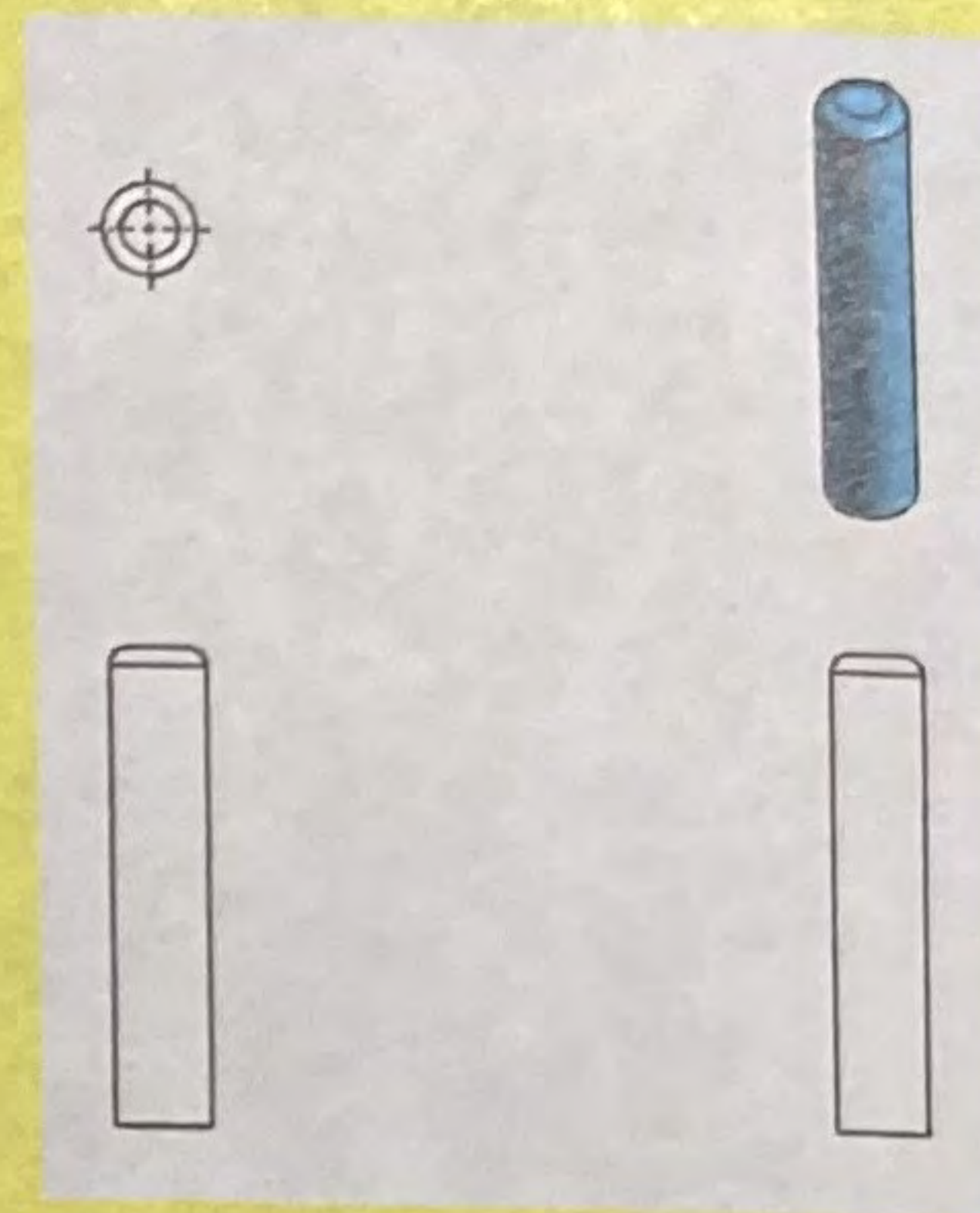
Landing pads



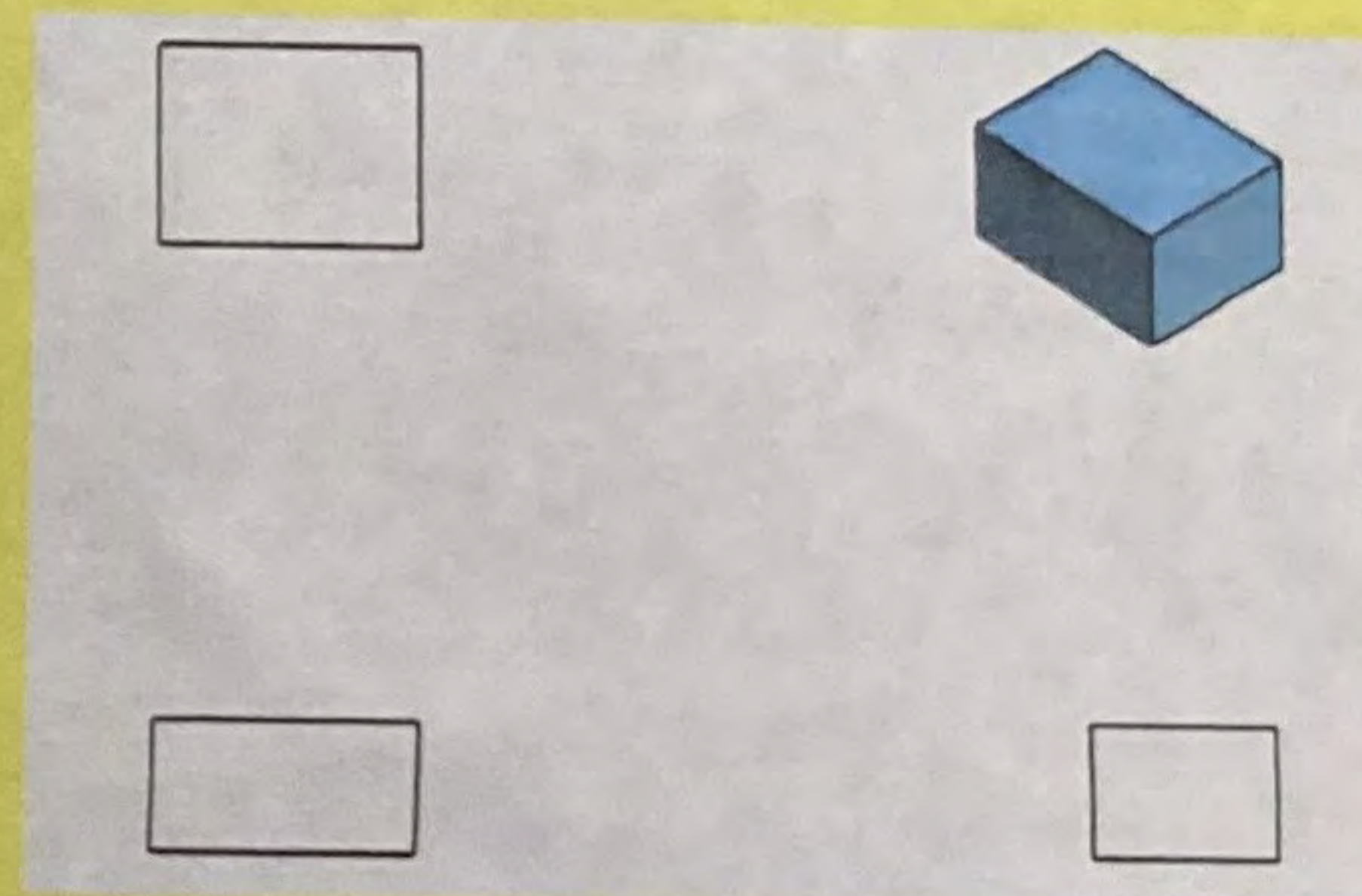
Solar panel



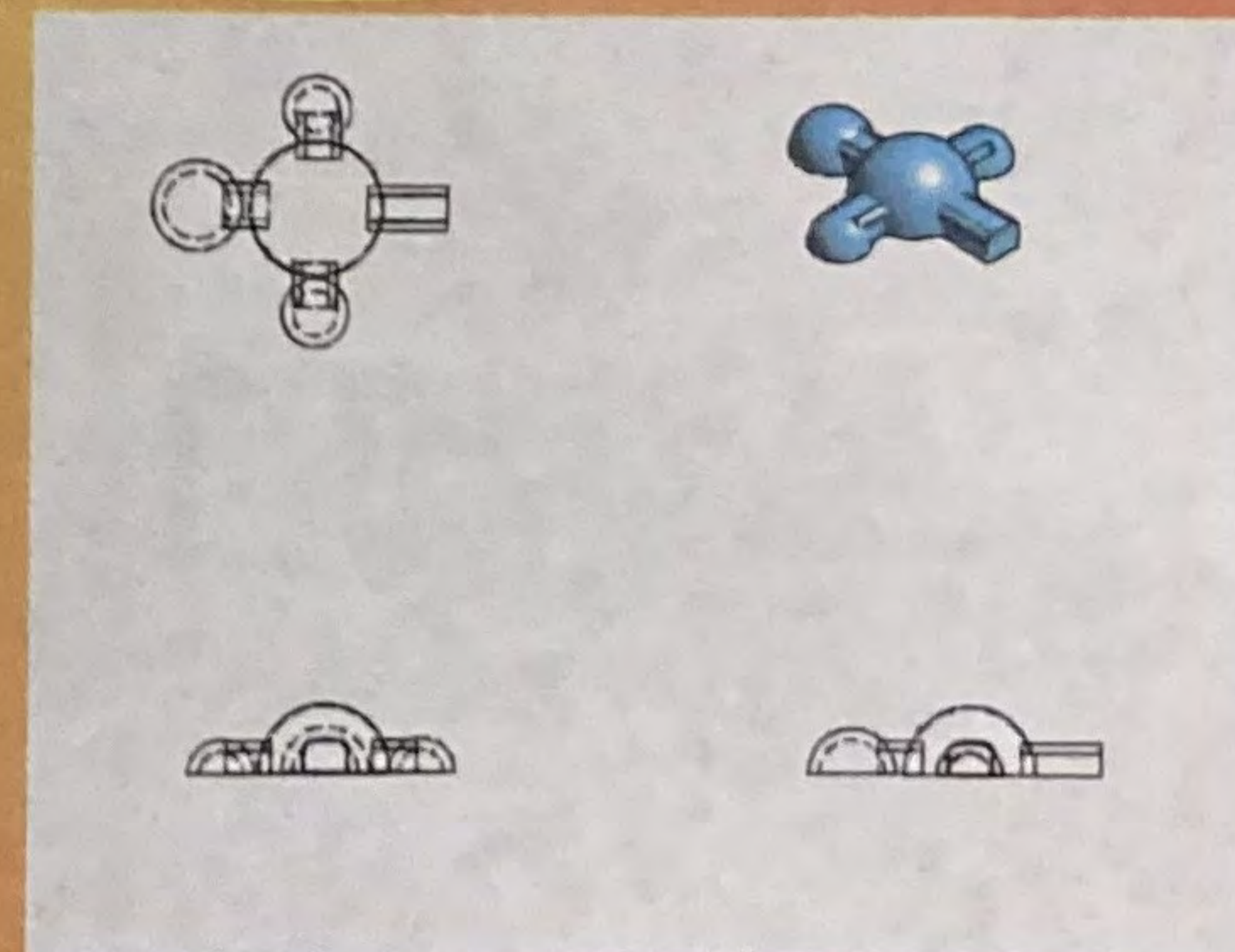
Communications dish



Small modular reactor (SMR)



Representation of the not yet created ice miner



Lunar habitat