VR Lunar Habitat

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.

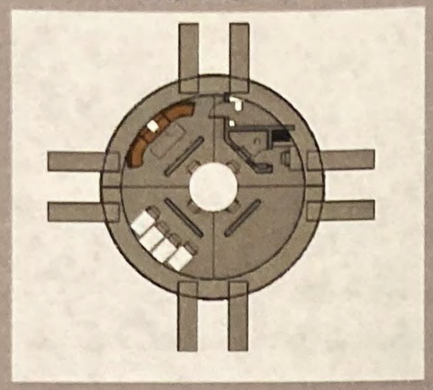
- Look professional.
- Everyone on the team should plan to talk.
- Update your brochure with you latest prototype and information.
- Make sure your QR code works for everyone.
- Update your tri-fold with your latest information—less about early concepts, more about features.
- The better your model looks, 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 Habitat

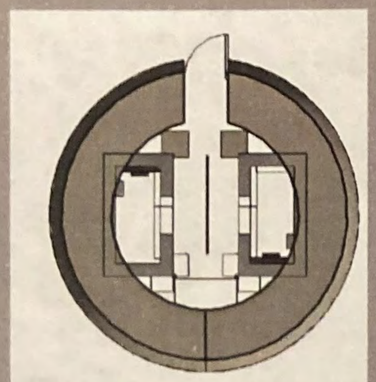
- Make your video smooth and relatively slow so that people can follow the motions.
- Have your video on your computer, not pulling from the web—internet may be spotty.
- Start your video high of the habitat above so they see the overall view and they can visualize where they will be going. Labels on modules?
- Change your views so that people are able to see the ceiling and the floors so they get the full layout of the room.
- Plan to talk through the video so people receive the personal conversation with the team not a recording.
- Make sure the software you are using doesn't elongate the rooms and the dimensions match those in the original presentation.
- Show packaging and stowage for enough food needed for 4 people to live for 6 months.
- 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.

Designs

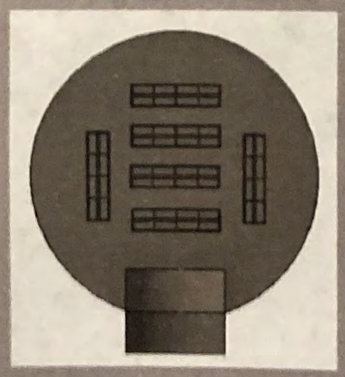
Habitat



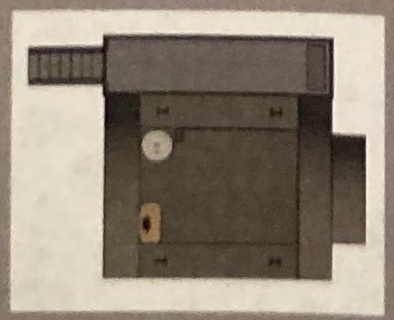
Storage/ Sleeping



Greenhouse



Airlock



WARREN TECH

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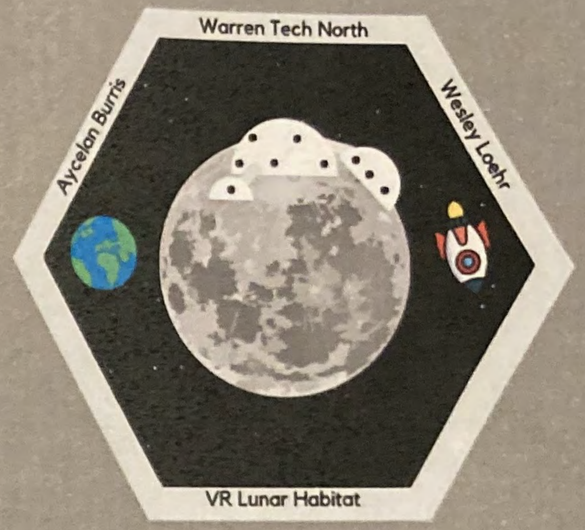
Wesley Loehr

Website

VR Lunar Habitat

Team #1



Mr. Brown

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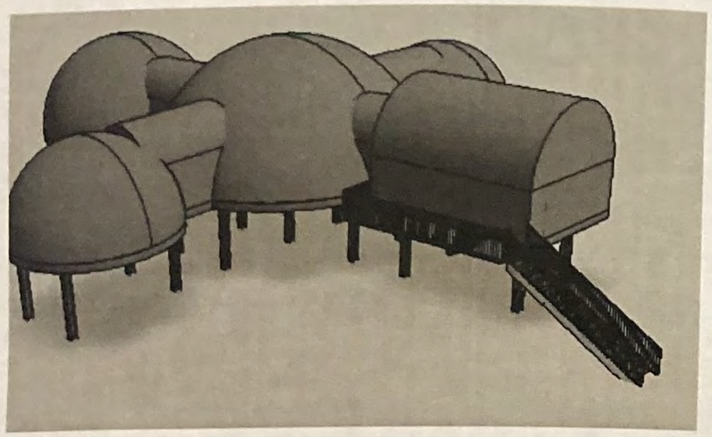
Aycelan Burris, Wesley Loehr

Lunar Habitat



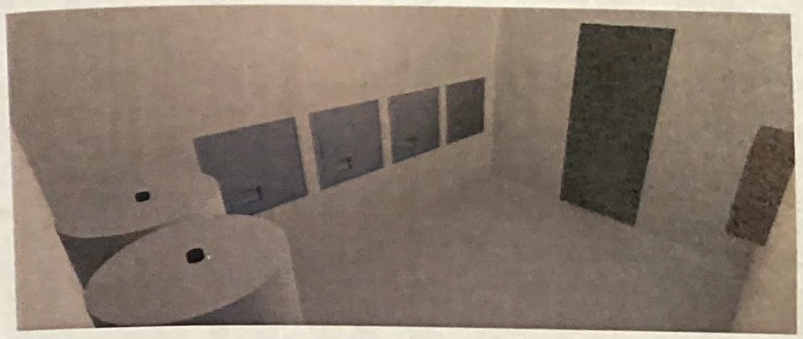
Our goal for the VR Lunar Habitat project was to design a lunar habit to simulate what it might look like, living on the moon.

Criteria

- Raised porch area outside the airlock
- 4 space suits, equipment, tools, and a fire extinguisher in each room.
- Lighting and climate controls-- on module walls near the hatch
- Hygiene area
- Furniture
- Computer area
- Stowage
- 4 Sleeping Spots with personal storage

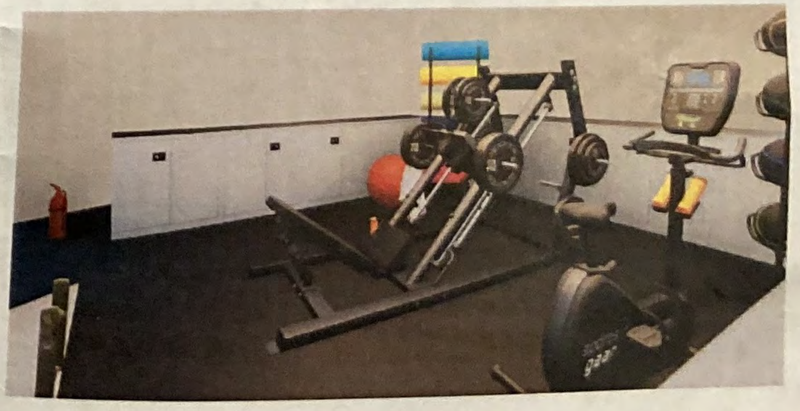
3D Renders

Airlock



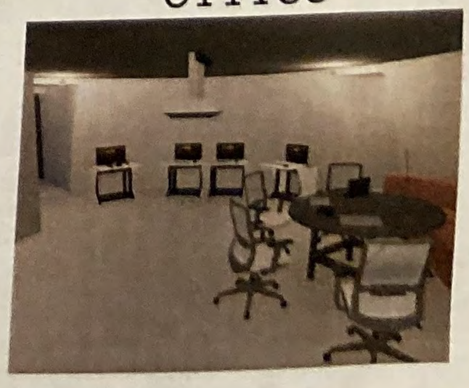
Bedroom

Workout Room

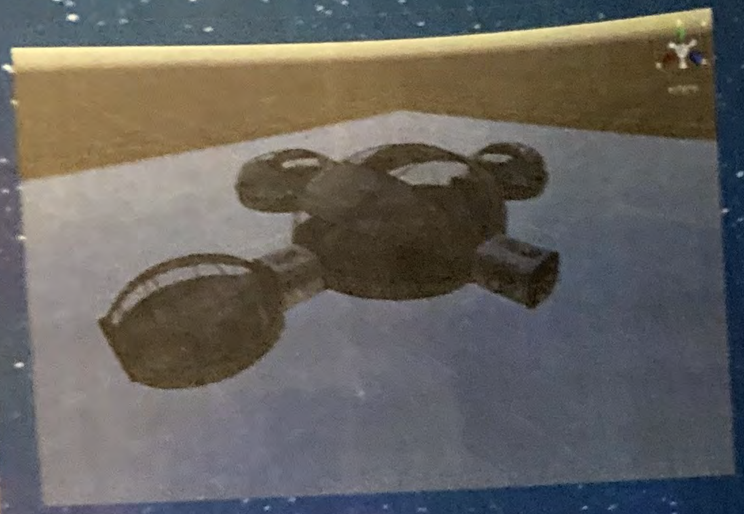


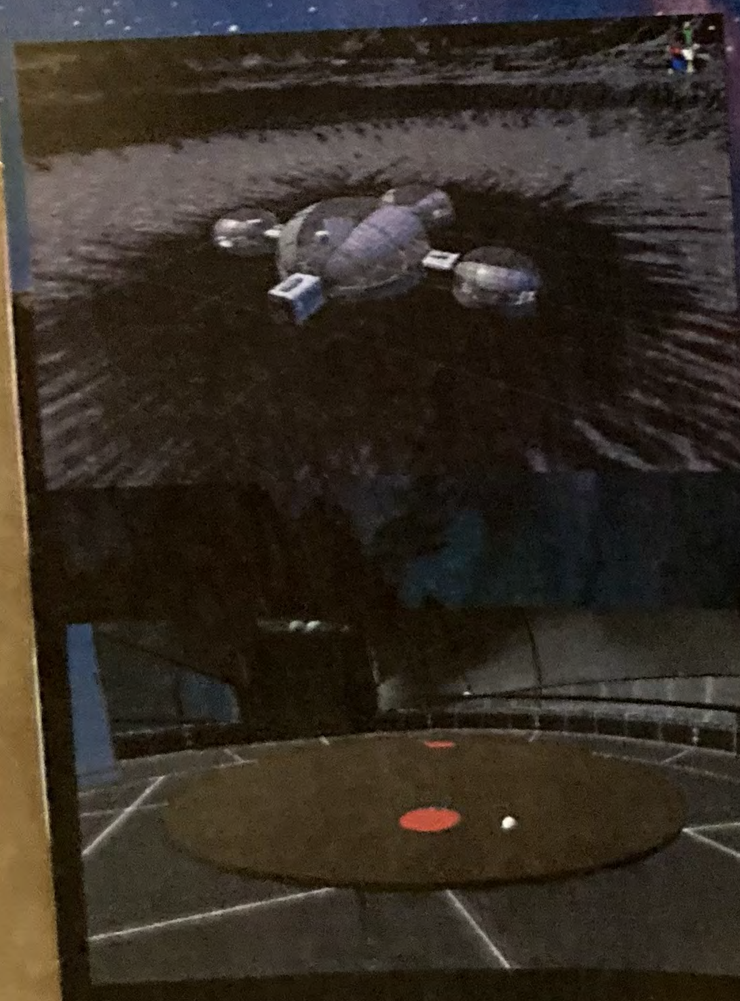
Bathroom

Office



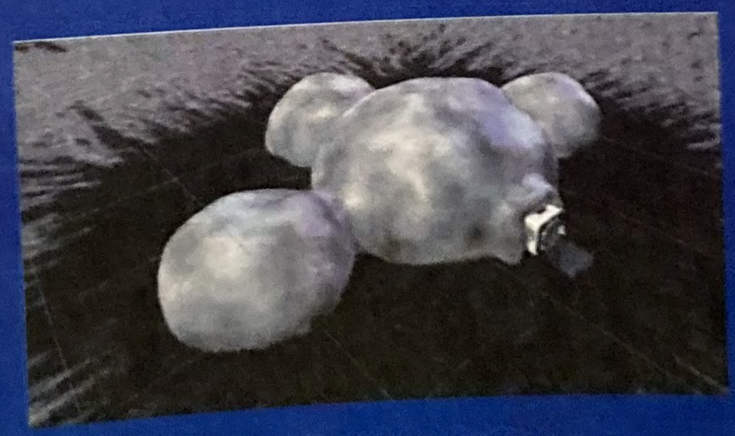
PROTOTYPE HIGHLIGHTS





Value Statement

We sought to create a “proof of concept” for a Lunar Habitat, simulated in a VR environment. This project will not only offer perspective on the execution of such a project, but also provide a rough simulation of how the habitat would function. The main goal of this habitat, as a finished physical product, is to provide a long term place for astronauts to live on the moon for purposes of exploration and research.



QUESTIONS?

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VR LUNAR HABITAT

D&P

PIONEER TECHNOLOGY AND ARTS ACADEMY

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FATE TX NEAR DALLAS TX

Joe P.
Elijah G.
Oliver R.
Dylan S.

WEBSITE

OUR OTHER DESIGN FEATURES INCLUDE A VAST AND EXPANSIVE EXTERIOR ENVIRONMENT OF THE MOON. WHILE THIS AREA OF THE MOON IS MEANT TO REPLICATE REAL MOON TERRAIN, IT IS NOT NECESSARILY DESIGNED AROUND A REAL LIFE AREA OF THE MOON.

THE NEXT STEPS FOR OUR PROJECT ARE TO IMPLEMENT CHANGES BASED ON FEEDBACK FROM THE CDR, AS WELL AS ATTEMPT TO IMPROVE THE SIMULATION'S PERFORMANCE TO MAKE IT MORE ACCESSIBLE TO THOSE WITH LOWER-END HARDWARE. ADDITIONALLY, WE ARE INTERESTED IN CONTACTING ASTRONAUTS TO REVIEW OUR DESIGN FROM THE PERSPECTIVE OF SOMEONE WHO HAS THE EXPERIENCE OF LIVING IN SPACE.

BEYOND THE REQUIREMENTS

OUR TEAM HAS GONE ABOVE AND BEYOND THE REQUIREMENTS, ADDING ADDITIONAL COMMODITIES TO THE PROJECT, CREATING A MORE LIVELY ATMOSPHERE. WITHIN OUR PROJECT, YOU WILL FIND SUBTLE NODS TO VARIOUS POP CULTURE FRANCHISES THAT THE TEAM ENJOYS. ALTHOUGH, THEIR PURPOSE OFTEN BOILS DOWN TO BEING ANOTHER FUN OBJECT TO THROW AROUND IN THE MOON'S REDUCED GRAVITY ENVIRONMENT.

DESIGN ASPECTS

Our project features a combination Stowage / Bedroom module as suggested to us at the PDR. We have greatly revamped this part of the project, featuring a proprietary bed design that is capable of converting into an extra work station. Our design also features a section of the main room dedicated to “Hygiene Pods”, an all-in-one bathroom solution, featuring a sink, shower, toilet, and mirror, all in a compact and private space.

QR Codes

QR CODE FOR GRADING TEAM 1

QR CODE FOR WEBSITE

QR CODE FOR POWERPOINT

More Information :

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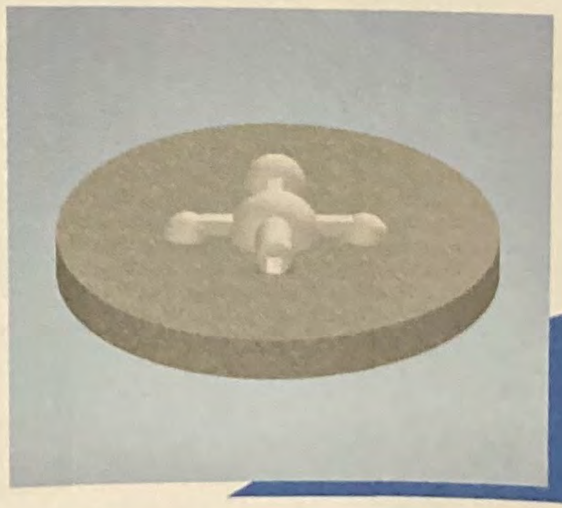
NASA HUNCH

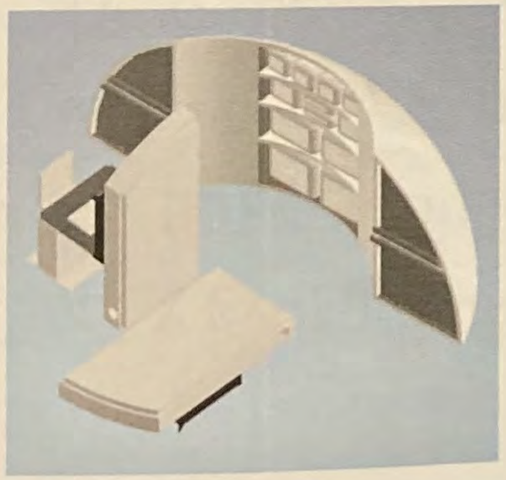
LUNAR HABITAT

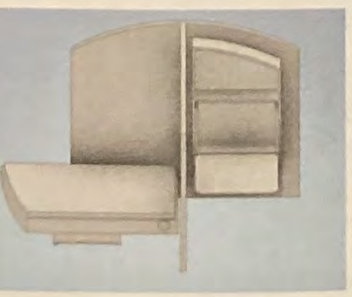
Creators: Angeline Hernandez, Evelynn Smith, and Aisha Syed for Mr. Robin Merritt, CCISD Clear Creek High School, 2305 Main E St, League City TX, 77573



Sleeping/Stowage Module

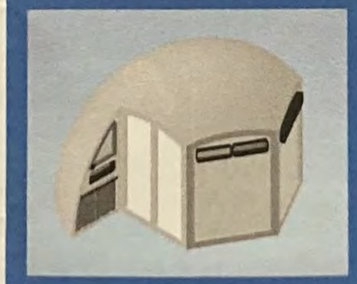
The sleeping and stowage domes are combined to create a singular, combined sleeping/ stowage module. There will be 2 domes present in the Lunar Habitat that follow this design. On one side of the dome there is a shelf that wraps around the wall, and the other has 2 beds separated by a wall. The shelves have a curved structure to fit perfectly in the dome, with drawers that can come out and bags of many sizes. The beds are made with a design that allows them to be stored standing upright and used as a desk when closed. The chair for said desk also acts as a closet for extra stowage.

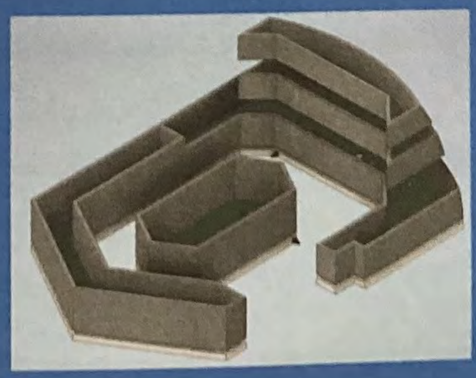




Bamboo Module

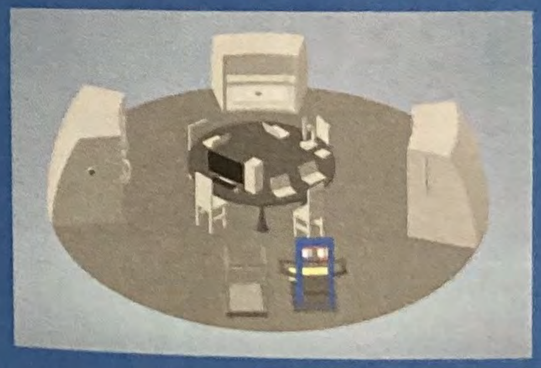
The bamboo module, which works in tandem with the ECLSS system in the main module, grows the bamboo needed to provide oxygen that the astronauts are going to be breathing in the Lunar Habitat. Immediately upon entering the module, the structure that contains the bamboo beds can be entered via the door on its right side. The bamboo beds are configured in a way to ensure the bamboo grows well, with giving the bamboo roots enough room to stabilize, as well as other precautionary procedures. The beds have a drainage tray located underneath the bamboo beds to drain out the water for the bamboo plants. The CO_2 enters the structure through one side of the vents, and the oxygen exits the other side, from which it leaves the module and goes to the other domes through ventilation present inside the hatches.





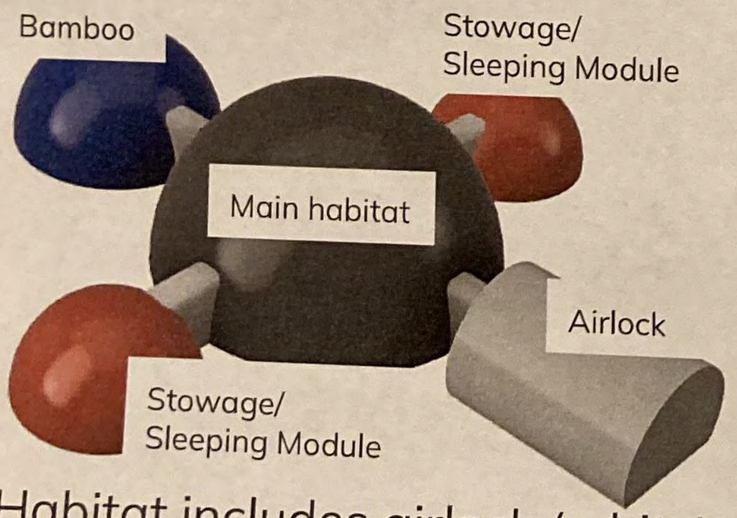
Main Module

The main habitat is divided into 2 stories. The first story is classified as the tech/science area with the ECLSS system, the communication center, the vacuum chamber, work out equipment, etc. The second story is classified as the recreational area, with it having the bathroom on one side with medical shelves, and a kitchenette, seating, a table, and more. The astronauts can access the second story through the use of a ladder secured at the top of the second story. Piping runs from the sinks upstairs down to the ECLSS system on the first story. The main module leads to the rest of the modules through hatches and the airlock. The airlock has all the equipment and tools needed to prepare the astronauts to venture into the lunar surface.



Why a VR Habitat?

- More familiar with Habitat
- Easily transferable
- Can be viewed anywhere
- Faster and cheaper to produce than a physical model



Habitat includes airlock (white), main habitat (grey), bamboo greenhouse (blue), and storage/sleeping modules (red).

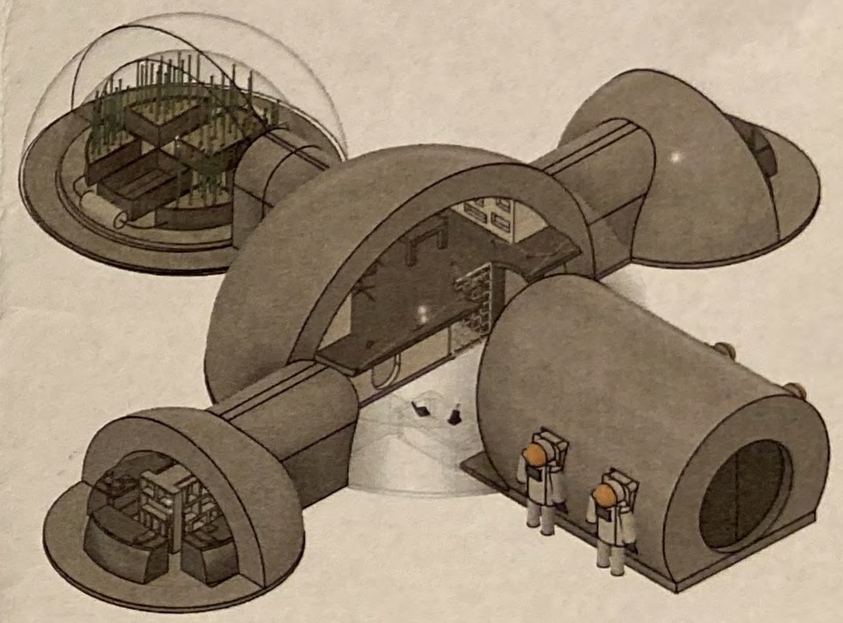
Product Video (Youtube link)
Also viewable on our website (see below)

Any Questions?

Feel free to contact us at
GHSVRHabitat@gmail.com

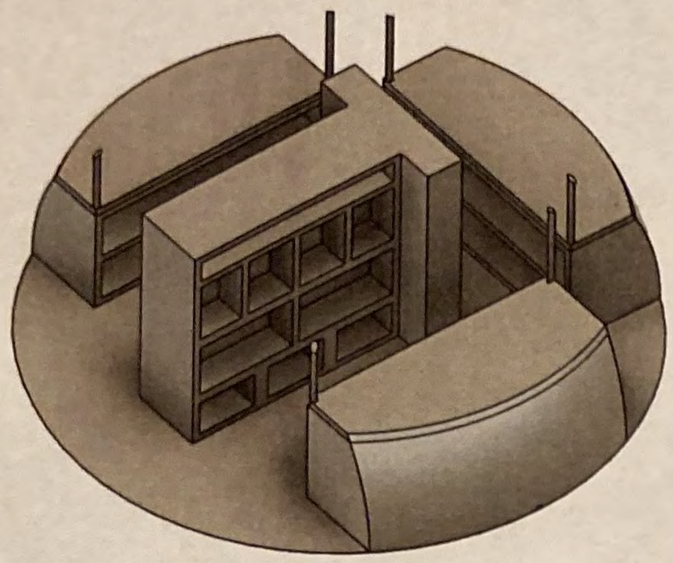
sites.google.com/inst.hcpss.org/GHSVRHabitat

VR Lunar Habitat



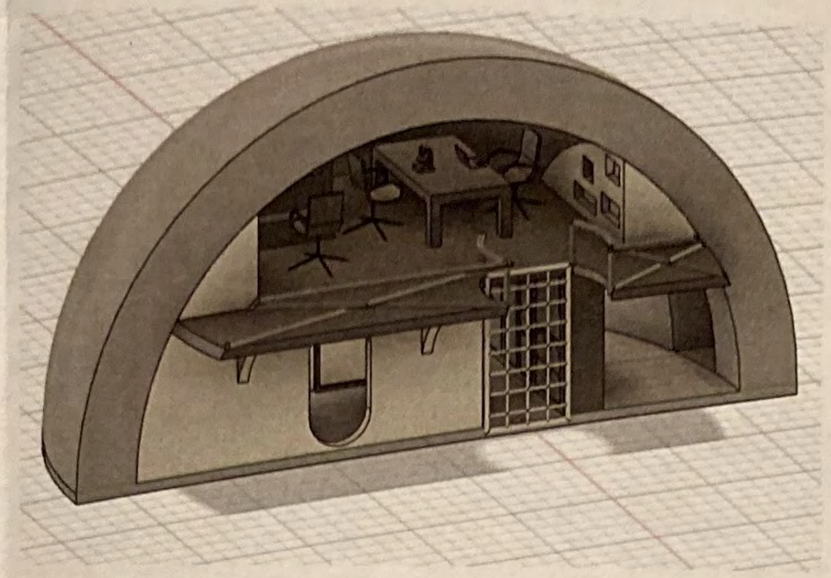
Nick Euteneuer
Adam Lease
Glenelg High School
Mr. Gerstner

Prototypes



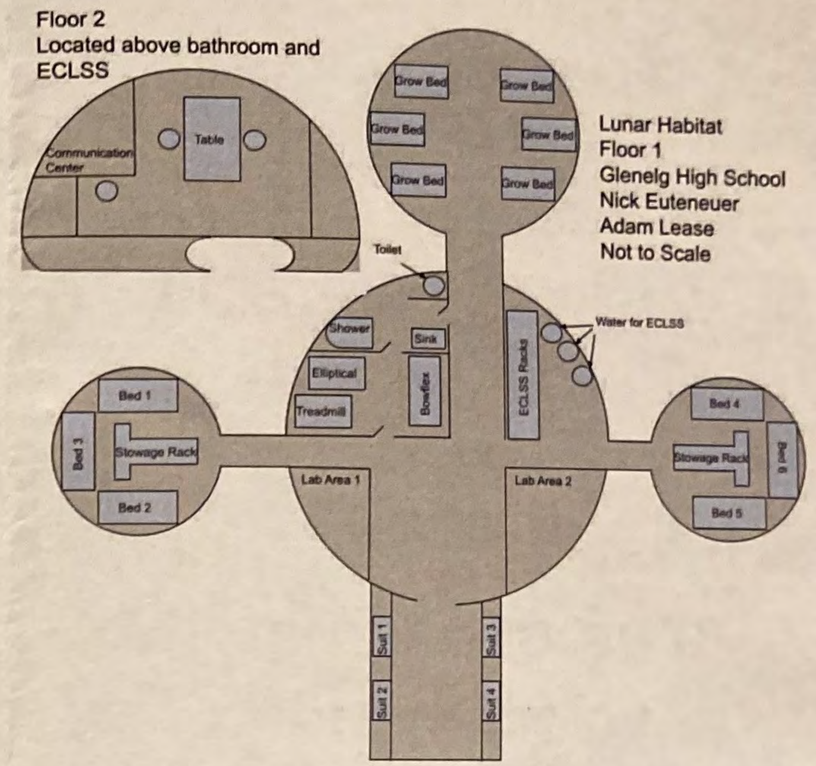
Stowage and Sleeping modules have been combined for comfort.

Optimization of Space

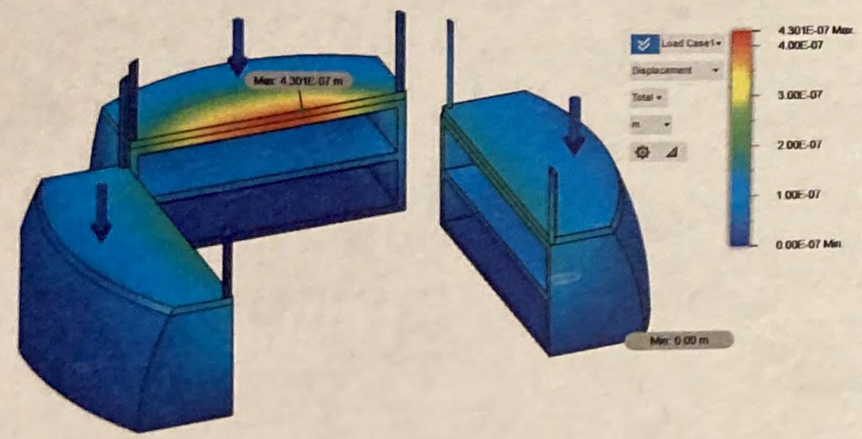


Main habitat contains exercise room, bathroom, loft with laptops, ECLSS racks, and lab area.

Final Design



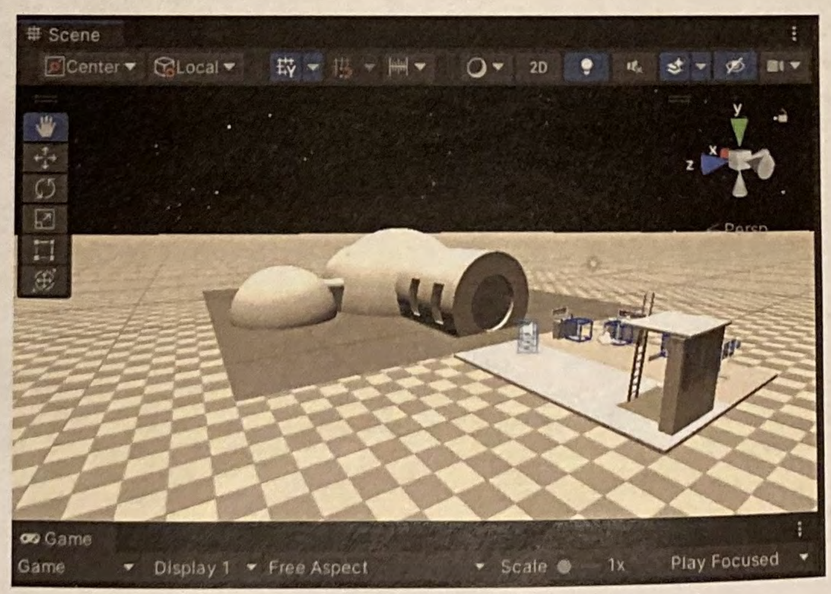
Testing



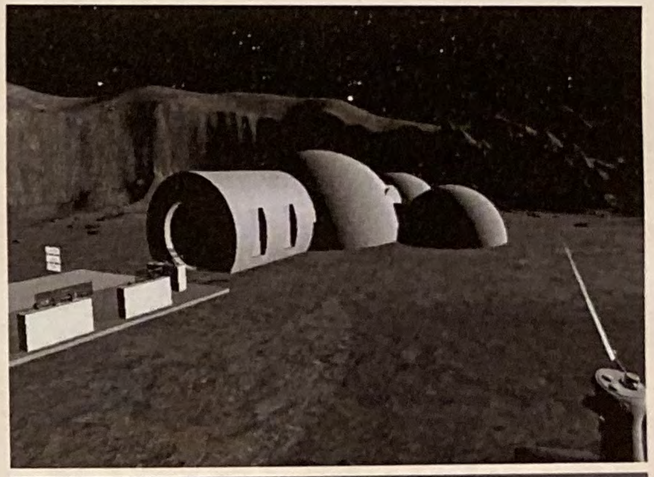
Stress tests to ensure functionality and safety

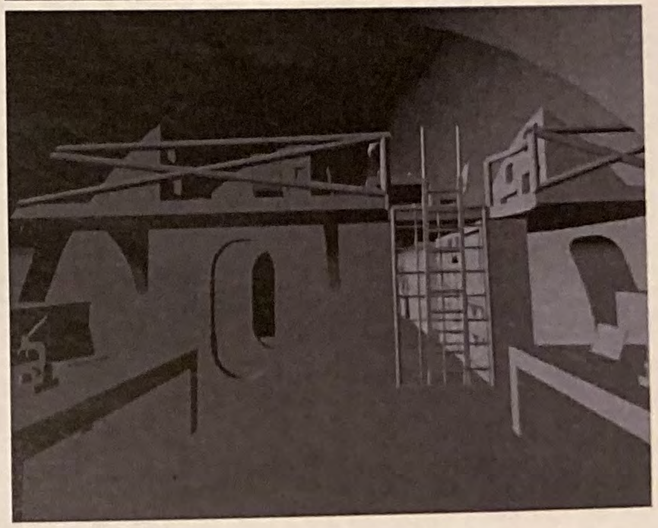
The Habitat was created in Fusion360 and moved into Unity.

Creating the Environment



Moon texture and space sky was added for realism.





Problem statement

The problem this project our teams with is designing, modeling, and coding a functioning and realistic VR simulation for astronauts to experience an idea of what it would be like to work and live in a lunar habitat setting.

3D Models

Models for space toilet and living quarters beds

Habitat shelfs and table

VR LUNAR HABITAT

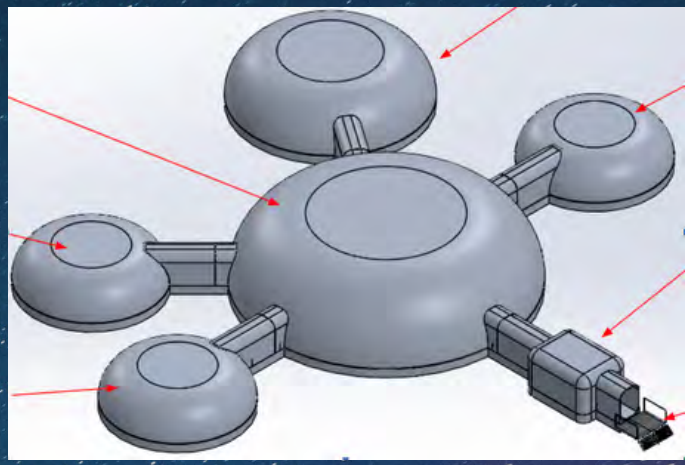
Jacob Phelan, James Reni,
Brandon Shackleford,
Jacob Dawodi
Palm Bay Magnet High School

Solution

Our solution is the actual simulation and there is a video of the simulation working the video goes into what the habitat looks in VR and how things and objects interact

The QR code on the right is the link for the tour video.

CAD 3D MODEL



This is the 3d model of the lunar habitat and the different stations where the astronauts can live in

Habitat chair and fire extinguisher and bicycle for gym

Habitat lights and commcenter table

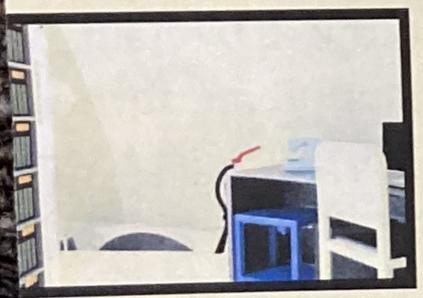
water filter

Main Module

By: Austin MacPherson

Mission

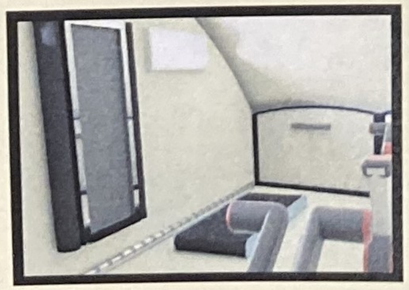
- Provide a place to to Test
- Provide a place to Eat and store food
- Provide a place to save and compute data
- Provide an area to keep the scientist fit
- Provide an area to maintain physical health
- Provide the whole habitat with water and air



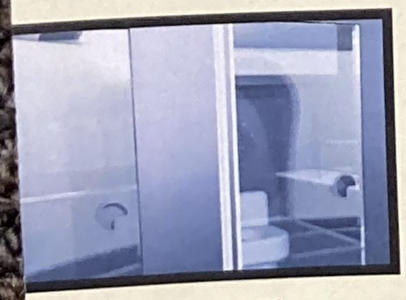
ommunication Center/ Comp. Room

Kitchen and Dining Area

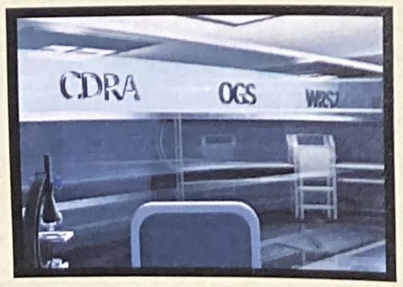
ab/ Experimentation Area



Gym/ Workout Area



athrooms and Shower



ECLSS/ Life Support System

H.U.N.C.H.

WILDCATS

Cypress Woods High School
Jarrall.ford@cfisd.net

VR LUNAR HABITAT

NASA HUNCH

VIRTUAL REALITY LUNAR BASE

DESIGNERS: AUSTIN MACPHERSON, LIAM RADER, BRANT RODRIGUEZ, CORBIN LORD, ALAN JANDIK

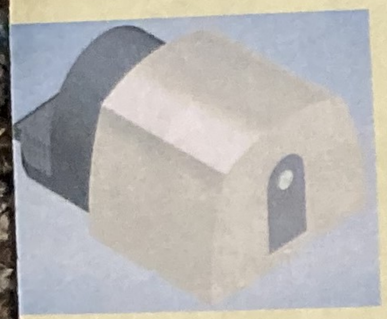
INSTRUCTOR: JARRALL FORD

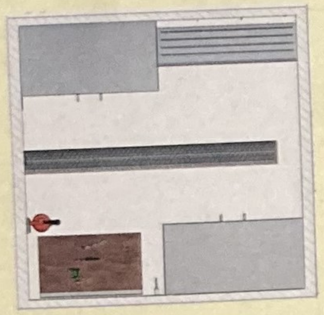
CREATING THE AIRLOCK AND MUDROOM

This is the Airlock and the Mudroom. It was made for the astronauts to have a place to store their space suits, work on equipment, and store anything that they might need when they are on their moonwalks.

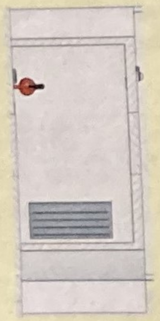
In the airlock there is a bench, roof netting for storage, fire extinguisher, and intercom with a climate control system.

The mudroom includes a two space suit holders, an oxygen refill outlet, a workbench, a CO2 oven, storage lockers in the wall and a bench.

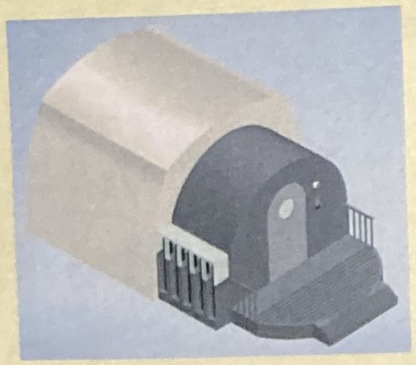




BACKVIEW



ENTRANCE



AN INSIDE LOOK — SLEEPING QUARTERS

BY. CORBIN LORD

outside

inside

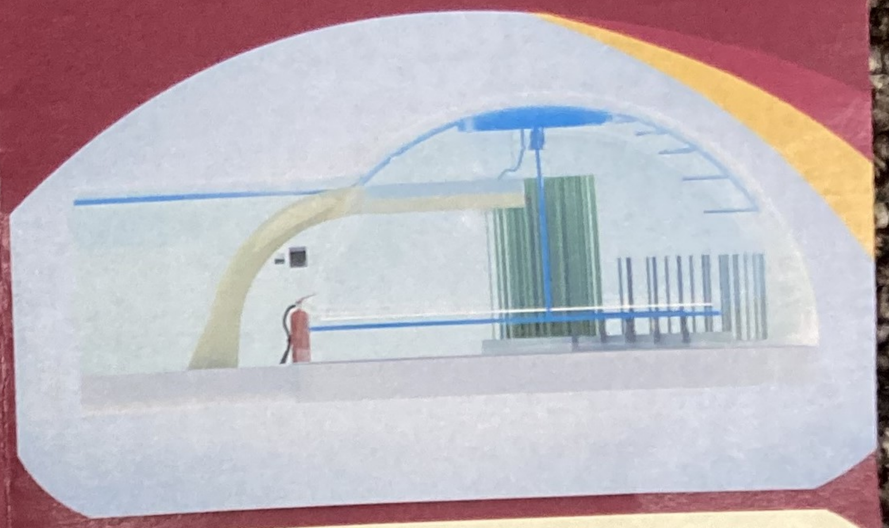
The Sleeping Quarters stand as a vital element, far more than just a place to rest. The Sleeping Quarters has all of the necessities you need to be able to have a goodnights sleep. The dome is supported on top of grate system that has 22 slots to use for storage, plumbing, electric wiring, etc. Then there are 4 slots for the beds to be placed in and they have a flat screen T.V. for entertainment and storage underneath the inhabitants.

Storage

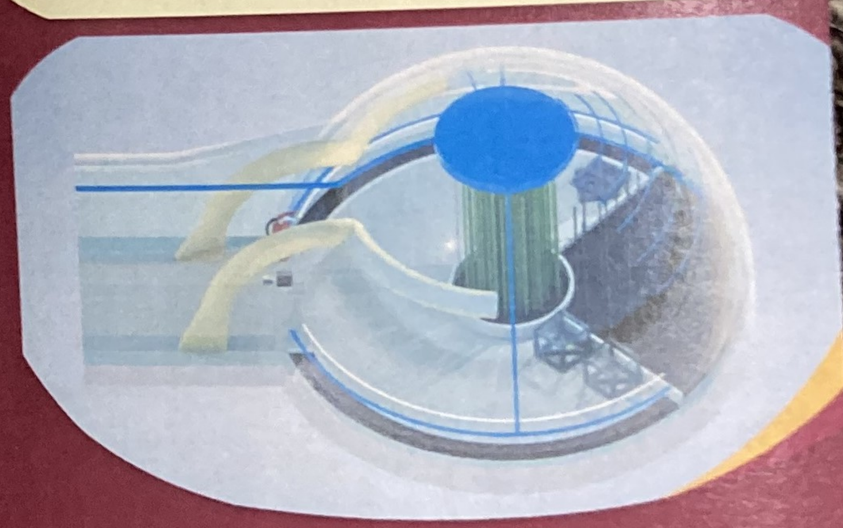
BY. BRANT RODRIGUEZ

The Storage Room is a crucial element to the habitat, as without it, there would be less space in the rest of the domes, and nowhere to store things. The Storage Room has hanging fabric lockers which are light and foldable. As well as two Refrigerators which each contain various materials such as: Medicinal Items, Cold Food, etc. The Floor has an array of panels which can be removed to reveal a foot deep hole for even more storage.

GREENHOUSE



The Greenhouse module's purpose is to supply oxygen to the astronauts, grow fresh foods to supplement their diets, and provide an area of greenery to fortify the astronauts' mental health during the long stay on the lunar surface.



Renderings use transparent walls to properly show inside, modules use opaque fabric and are inflated.