Student and Teacher Questions and Answers

VR Lunar Habitat

I had a question I was hoping you could help answer about an aspect of the lunar habitats that NASA will be using on the moon. Will the walls of the habitat go vertically for a couple of feet before going into a dome or will it start doming straight from the ground. I was just asking because that would effect what I could put right up against the wall.

If you want to give it a short vertical segment of 1 ft or so, I think that could still be accurate but if it were much taller than that, I think there would be some issues with the dirt that is placed on top starting to have buckling problems.

According to the project slides, I need to include ECLSS racks in my design. However, I'm not clear on how many I need and where they need to be placed across the habitat. I understand ECLSS are composed of four racks. Do I only need one place for the 4 racks? Or do I need to incorporate multiple sets of racks in other areas as well? If you could find the time to get back to me, I would greatly appreciate it. Thank you!

Dave

One set of racks is sufficient, you might want to locate them adjacent to where the bathroom is for the water reclamation unit.

Glenn

Good comments Dave. Being close to each other would save space. The racks do not need to be right next to each other but expect to have hose or piping connections between them. Exchange of water or gasses between them. Oxygen Generating System, Carbon Dioxide Removal System, Water Reclamation System 1, Water Reclamation System 2.

We are currently working on the Lunar Habitat project for the design and prototyping division and there are a few things that my team is uncertain about. Here are the questions we would like to ask you:

- Do all the materials for the habitat have to be taken in one trip, or we can transport them over time with several shipments?
- What is the size of the airlock hatches between different rooms of the habitat?
- What communication equipment is necessary to contact communication centers on earth? How much room would this take up?
- What are the dimensions of the Environment Control and Life Support Systems?

The focus of this project is to assume all the materials and hardware is already there on the Moon. Then their focus is to design the VR habitat with items to see what is inside.

For the size of the airlock, there are dimensions for the habitat on the power point and they can assume its tall enough for someone to walk through. This way they can estimate a number and I don't have to give them an exact number.

For the communication equipment, that is something they have to research and find out. They need to assume how much room they think they need.

For the "dimension of ECLSS" I am going to emphasize that ECLSS is dependent on what the needs are for the environment. This is something a student can research by looking at what is on ISS (which was listed in the ppt) and then decide what they need for the habitat. Again, I don't want to give them dimensions and instead let them make assumptions.

Here is thought—The 4 ECLSS racks were made those dimensions because it was easy to move them around in the microgravity of the space station. When we put them on the moon, we won't be able to move around refrigerator sized boxes as easily. Make your ECLSS racks any shapes you would like (within reason) but keep the same volume. So for example, if you make them cylindrical like columns, their structure could also work as support for the second floor in the main habitat (if you would like—not a requirement). How would you use that space?