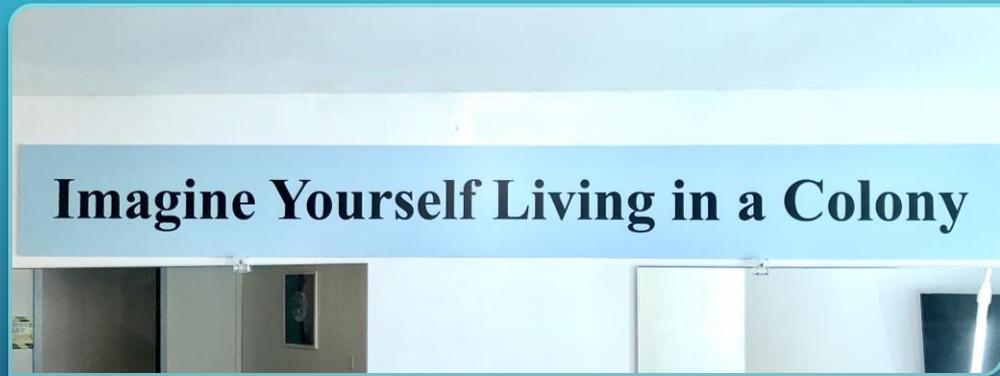


Image Credit: NASA

VIRTUAL EXHIBIT: SHACKLETON RESEARCH STATION

WHAT WOULD LIFE BE LIKE ON A LUNAR COLONY?



- Have you ever thought about what would happen if you left Earth to live on a lunar colony? The Earth is a very special planet. It supplies us with everything we need to live, like food and water. It is also the perfect distance away from the sun, so it is never too hot or too cold for us to live here. The Earth also has an ozone layer that absorbs the harmful rays from the sun that we don't need to survive. The Earth is an amazing planet!
- If you went to live on a lunar colony, what would you need to make sure is there before you left Earth?



Our internal clocks are influenced by exposure to light, our current activity, the temperature of our environment, and even how recently we ate. Living underground in this controlled colony system means that we don't always get those cues from being outside and seeing the movement of the sun through the sky. Adult humans need between 7 and 9 hours of sleep each night. This keeps us alert and functioning at our best.

We have a very tight schedule here in the colony including specific times when we are allowed to sleep. To help us out, we have to create artificial cues that let our bodies know that it is time to go to bed or wake up. This comes from changing the intensity of the lights and sometimes through the help of music. Since we live in tight quarters and share the sleeping area with others, it can be very difficult getting regular, quality sleep.

WHERE WOULD YOU SLEEP?

- Our internal clocks are influenced by exposure of light, our current activity, the temperature of our environment, and even how recently we ate!
- Living underground in this controlled colony system means that we don't always get those cues from being outside and seeing movement of the sun through the sky.

HOW TO REGULATE SLEEP OFF PLANET



Adult humans need between 7 and 9 hours of sleep each night. This keeps us alert and functioning at our best.



A tight schedule keeps the colony in order, this includes specific times when everyone is allowed to sleep.



To make a sleep cycle, we have to create artificial cues that let our bodies know that it is time to go to bed or wake up. This comes from changing the intensity of lights and sometimes through the help of music.



Since we live in tight quarters and share the sleeping area with others, it can be difficult getting regular quality sleep.



GOING TO THE BATHROOM

- Humans produce 4.34 ounces (123 grams) of waste each day!
- It is important that everything is recycled on the colony, even solid and liquid waste.

SOLID WASTE SEPARATION SYSTEM

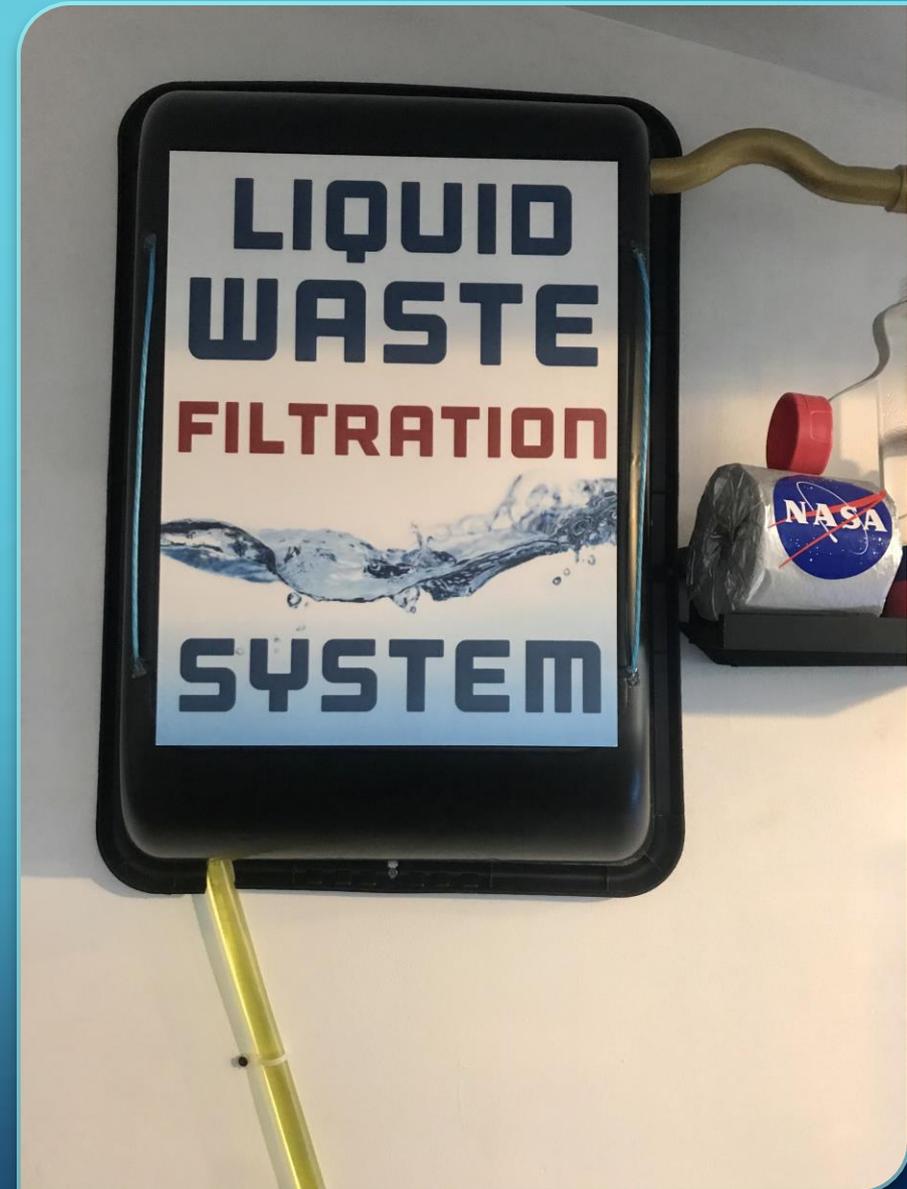


RECYCLING WASTE

- Liquid waste can be recycled into clean drinking water and solid waste can be used to fertilize plants.
- Astronauts are allowed 3 gallons (11 Liters) of water each day, so clean drinking water is very important!
- Each person in the colony has their own waste collection compartment, where solid waste is vacuumed sealed into separate bags.

SHOWERING

- On Earth, showering may be a normal and everyday experience, but in a lunar colony limited water supplies and lower gravity means that you don't get to stand under a shower of refreshing water. Instead, washcloths are used to rub water and liquid soap over the skin and hair. Any excess water is sopped up with towels and is recycled to be used again.



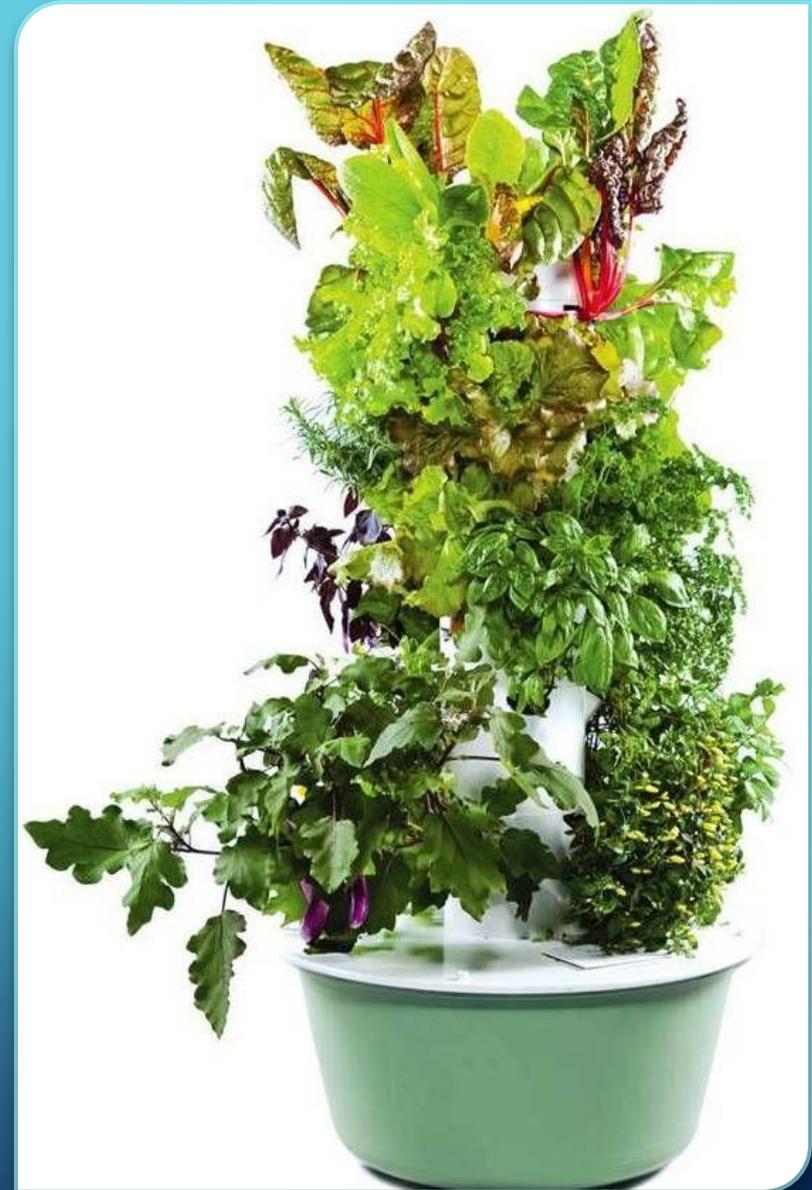


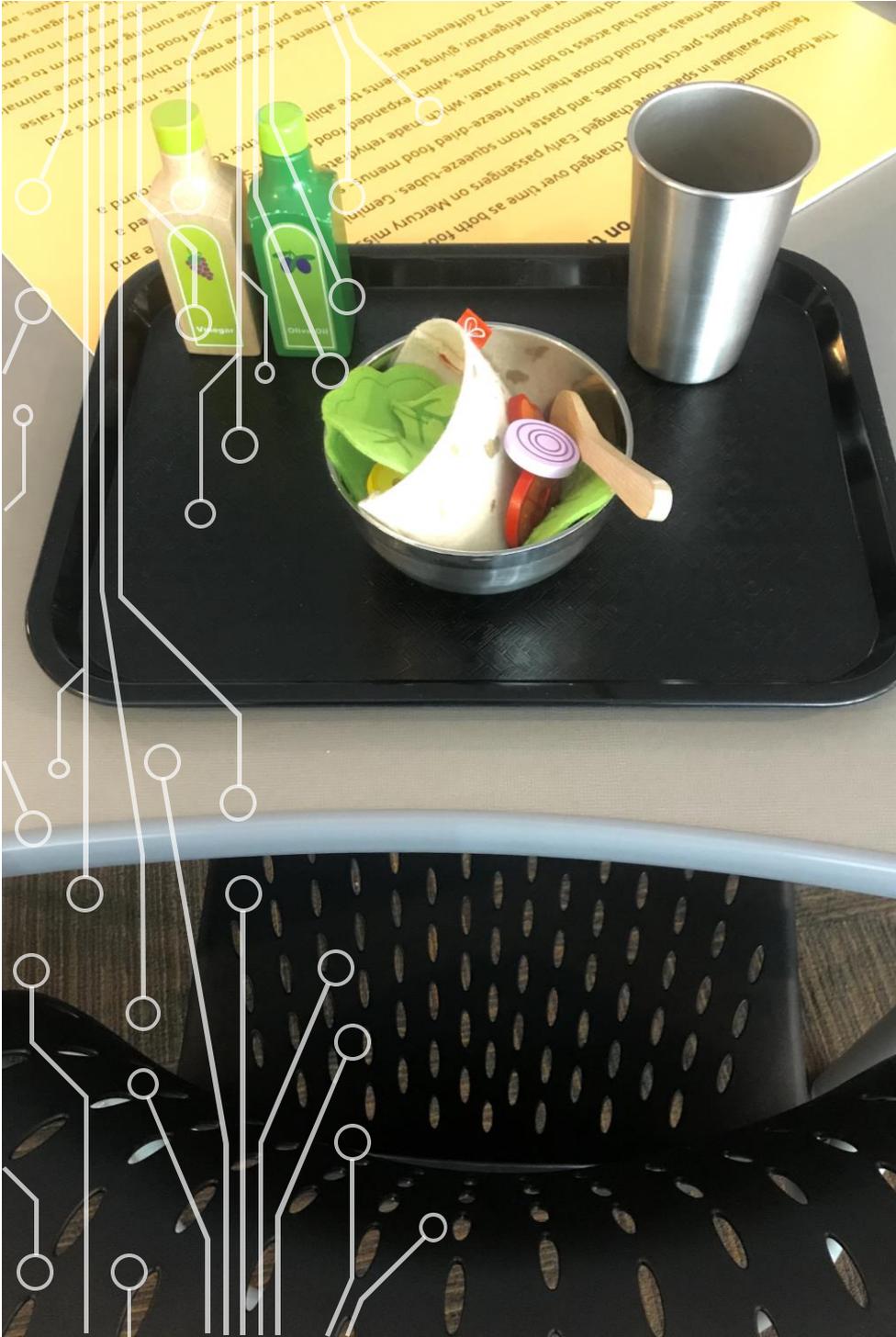
GROWING FOOD

- Transporting supplies to the Moon takes a lot of energy. Fresh vegetables and fruits would also not survive the journey.
- By growing produce on the Moon, fresh and nutritious food becomes available as often as possible.

HYDROPONICS

- Hydroponics are a great way to garden off Earth. The plants grow in a water-based system instead of soil. Water is continuously filtered from the base of the tower, full of the right blend of nutrient, to all the plants. By using the growing towers, more plants can grow in a small space.
- Of course, there are a few limitations- the plants grown have been chosen because they produce big crops and don't require that much special attention.





HISTORY OF EATING IN SPACE

- The food consumed by astronauts has changed over time as both food-prep technology and the facilities available in space have changed. Early passengers on Mercury missions dined on freeze-dried powders, pre-cut food cubes, and paste from squeeze tubes. Gemini astronauts had better packaged meals and could choose their own freeze-dried food menus. Apollo astronauts had access to hot water, which made rehydrating food easier to prepare and better tasting. In 1973, Skylab, the first U.S. space station, contained a dining area, freezer and refrigerator, giving residence the ability to gather around a table for meals and choose from 72 different options!

WHAT'S FOR DINNER?

- Today, a lunar colony could have an assortment of caterpillars, ants, mealworms and other insects to eat. Livestock, like cows and chicken, cannot be raised in space because of the amount of space, food and water those animals require. Insects are a better option to add protein to a diet. They can be spiced up with herbs grown in the hydroponic garden along with other vegetables that include the vitamins, minerals and sugars that we need to grow and stay healthy. Salad greens, soybeans, potatoes and sweet potatoes are an important part of an astronaut's diet. Someday, food production in space could even include wheat!



EXPLORING THE LUNAR SURFACE

- In our lunar colony, we have a moon rover that allows you to explore the Moon's surface safely.
- Exploring the surface gives us the ability to collect dirt samples and chart the surface of the Moon. This knowledge help us better understand the Moon and space.

FACTS ABOUT THE MOON



- The Moon is 240,000 miles from Earth
- The Moon is 1/4th the size of Earth-Equator diameter-3,476 km (Earth 12,756 km)
- Gravity of the Moon is 1/6th that of Earth
- The moon is mostly made of basalt (volcanic rock), also found on Earth.
- Temperature range -230o F to +292o F (-193o C to +111o C) night in polar region to the day at equator
- It takes 3 days to reach the Moon from Earth. That is an average distance of 383,022.9 Kilometers (238,00 miles) traveling at an average speed of 5319.69 Km/hour (3,305.5 mph)

SHIPMENTS FROM EARTH



- Un-crewed spaceflights are done primarily to delivery cargo.
- On average, it cost \$43,180 to send one *pound* of cargo into space!
- In the lunar colony, there is a clock that counts up and a clock that counts down. One clock measures the amount of time it has been since the last shipment and the other is the amount of time it will be until the next.
- The International Space Station receives shipments from Earth every 40-45 days or 8-9 times a year.
- Click to see [How Food is Prepared and Delivered to Space](#)

WHAT DO ASTRONAUTS DO ON THE INTERNATIONAL SPACE STATION?

Click the links below to watch some fun short videos about living in space!

[Everything About Living in Space with NASA Astronaut Reid Wiseman](#)

[Running in Space with NASA astronaut Karen Nyberg](#)

[Sleeping in Space with CSA Astronaut Chris Hadfield](#)

[Brushing your Teeth in Space with CSA Astronaut Chris Hadfield](#)

[Keeping Clean at the ISS with ESA Astronaut Samantha Cristoforetti](#)