2020-2021 City Model Slideshow

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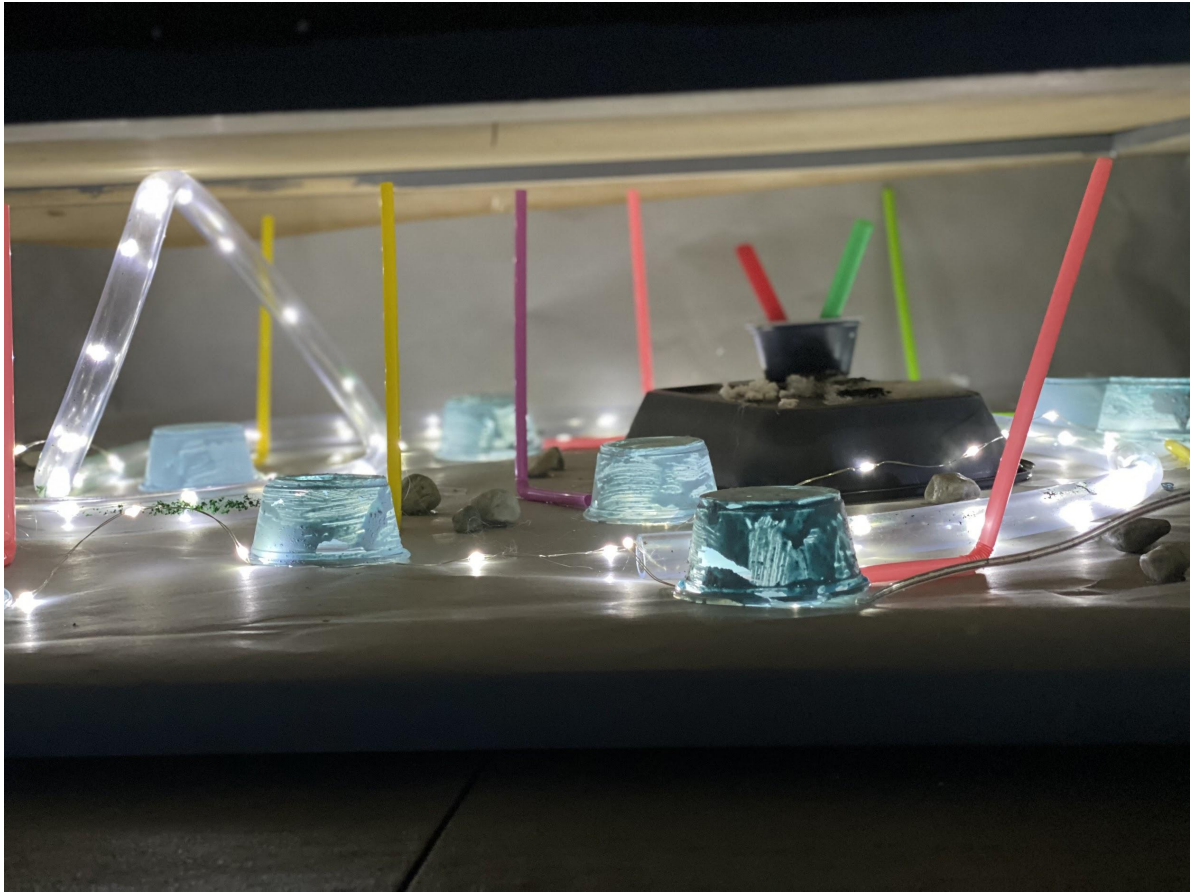
Future City Team Name: **Crescent City**

Section I

CITY DESIGN

Residential Zone

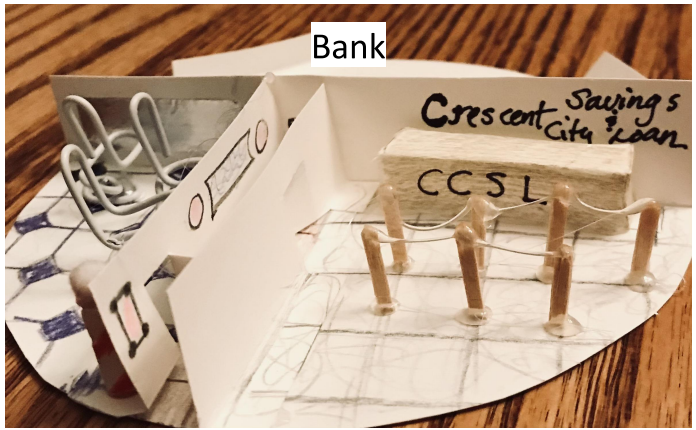


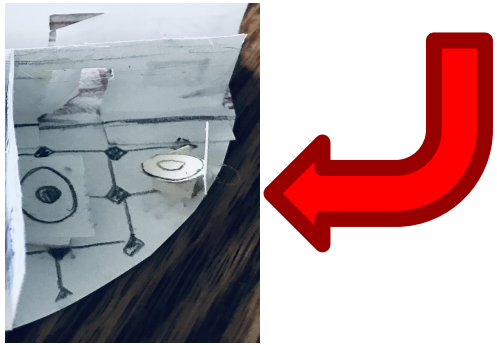
The residential zones of Crescent City provide a safe habitat for all the citizens to reside. These areas are built underground through the lava tunnels that exist beneath the moon's surface. This provides protection against extreme heat, cold, radiation, or meteorites. Air tubes are provided in each residence, bestowing necessary, fresh air and temperature controls. The air is provided through an air circulator. This makes not having a space suit indoors no problem at all.

Commercial Zone Examples #1

These are close-up sections views of some different commercial zones located throughout the city. These regions are located near the residential zones for ease of commuting. The commercial zone would be similar to those on Earth. Crescent City has offices for working and a barber shop for haircuts. These are both very important to the citizens' everyday life. The most important though, is the supermarket. This is where all of the citizens get their food, including produce. Our produce is grown within our city's agricultural centers. All of these buildings would be encased in 3D printed domes lined with regolith.

Commercial Zone Examples #2





Several other business establishments that contribute to the society are a bank and meeting room. These help the economy and investments to Crescent City in numerous ways. Our elected officials and business leaders use our high-tech virtual reality meeting rooms to have holographic meetings with leaders from other lunar outposts as well as people back on Earth. There are also functioning bathrooms next door to the meeting offices, for “special” breaks. Our bathrooms collect and recycle waste to provide water for plant irrigation and fertilization.

Industrial Zone

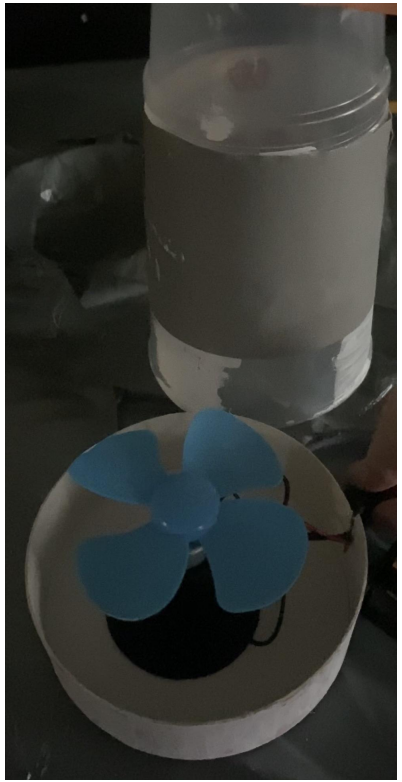
The industrial zone includes a conveyor belt. This machine, built by our mechanical engineers using 3D printing, transports materials extracted from our mining sites, such as regolith, titanium aluminum, and lunar ice to our processing plants where they are converted to usable materials. The conveyor belt then transports the materials to the surface of the moon. There, workers collect the materials and use them for various things such as converting the lunar ice into purified water using reverse osmosis, and processing metallic ore into building materials.

Infrastructure Example #1

The infrastructure shown here is a Sunflower Tower. These tall towers have a substantially sized solar panel on top that collects solar energy for use in the habitats located beneath the lunar surface. These towers are tall enough to capture the sunlight even when Crescent City experiences its two weeks of night. There are also tight bands all around the tower for extra structural integrity and stability, as well as efficient storage of the solar energy.

This structure overcomes the challenge of having little to no electricity, air circulation, and many other important energy-based buildings. The Sunflower Tower can provide the necessary energy.

Infrastructure Example 2

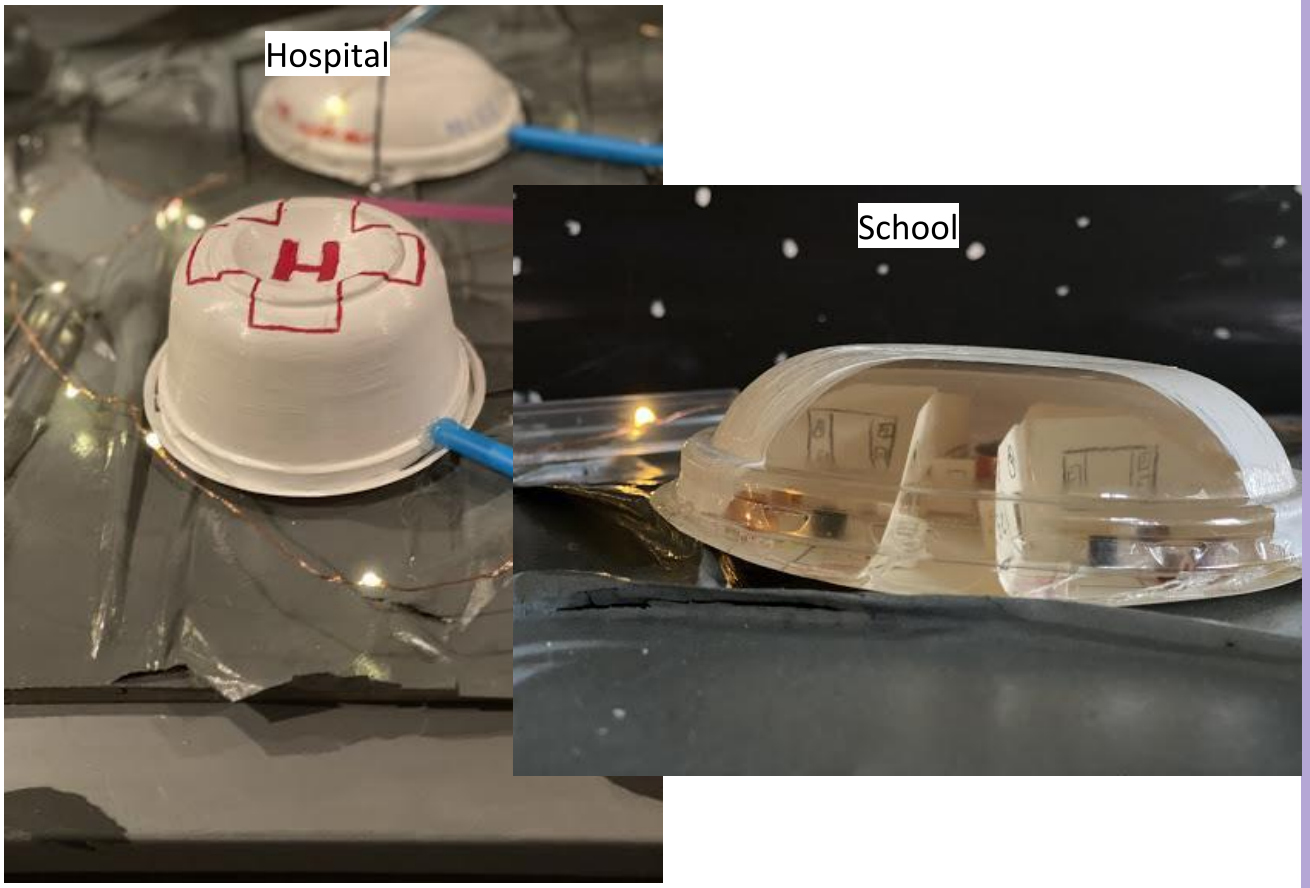


This is an air circulator and a light source. The air circulator supplies fresh air for all indoor buildings including houses, offices, hospitals, schools, and many more areas. It has a wind turbine that, with energy from the Sunflower Tower, can produce air into all the residential areas with pipelines. The light source is a fantastic sight to see as a tourist, and can shine the entire surface of the moon and the lava tunnels even during the darkest of nights. This is possible through the power of the Sunflower Tower.

Infrastructure Example 3

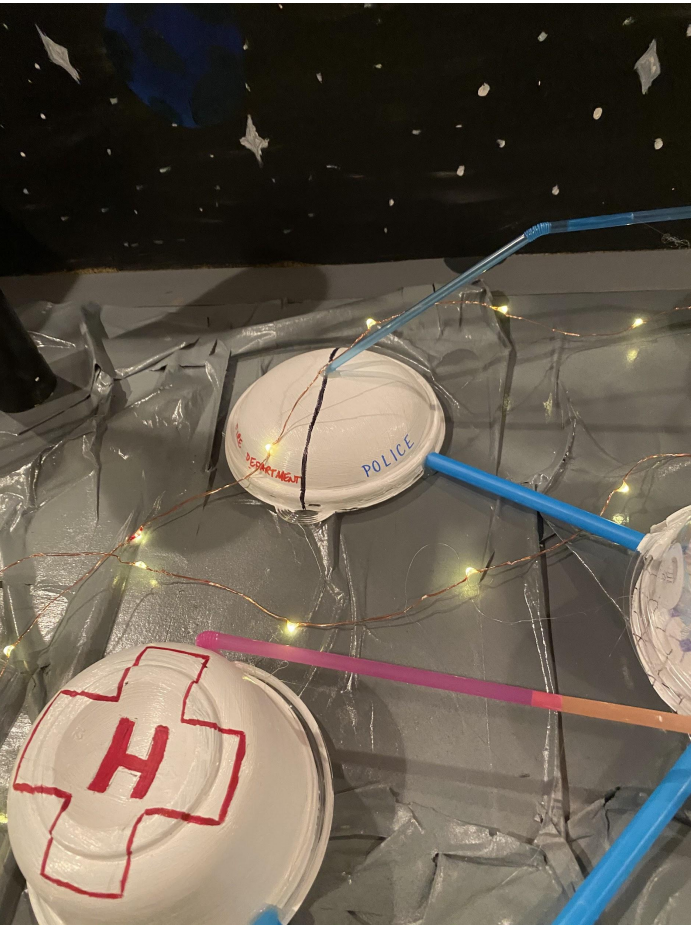
This shows the communication satellite dish that is used to communicate with Earth. This equipment is also large enough to transmit to other locations around the universe, including Mars. The satellite is protected by an electromagnetic field that deflects incoming micro-meteorites.

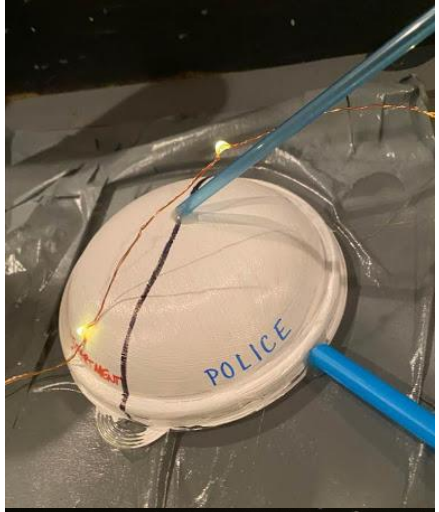
City Services Example #1

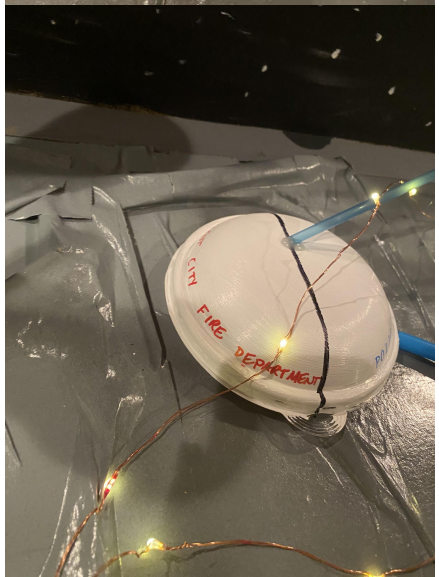


This slide includes a hospital and a school as services for the city. The hospital is very important for obvious reasons. If something goes wrong in a moving part or in an ice mine, the hospital is there to help people. We also have a school. This school will educate children of the regular things you would see in a school, plus some new information on Crescent City and it's foundation history. Here students will learn STEM, and can even enroll into holographic virtual schools. Moreover, college offers many different career paths which are at the student's disposal.

City Services Example #2







This slide includes a Police Station and Fire Department.

The Police Station is used for regulating crime around crescent city. Although it is a futuristic city, that doesn't mean there won't be criminals. The police also make sure that the machines and mines are operating safely and the transportation network is functioning properly.

The Fire Department plays an important role in keeping the city safe as well. They use a chemical clean agent suppression system developed by chemical engineers to put out any fires without harming people or damaging structures.

Transportation Example #1

The transportation shown here is the Mag-lev Hyperloop Subway. This system is possible due to the magnetic levitation that goes through the tracks. The civil engineers built this inside of lava tubes throughout sites and neighborhoods for safe and efficient travel. The subway can go up to five hundred miles per hour and has two rails.

Transportation Example #2

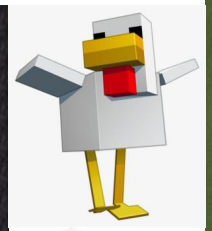
This is a moon rover.

This moon rover is a good way to get from place to place in short distances on the moon's surface. It is also good if you just want to stay on the surface of the moon, as it uses extremely sturdy wheels to propel itself on any ground surface. Additionally, the rover is used for tourist purposes to show them the sites on the lunar surface.

Transportation Example #3

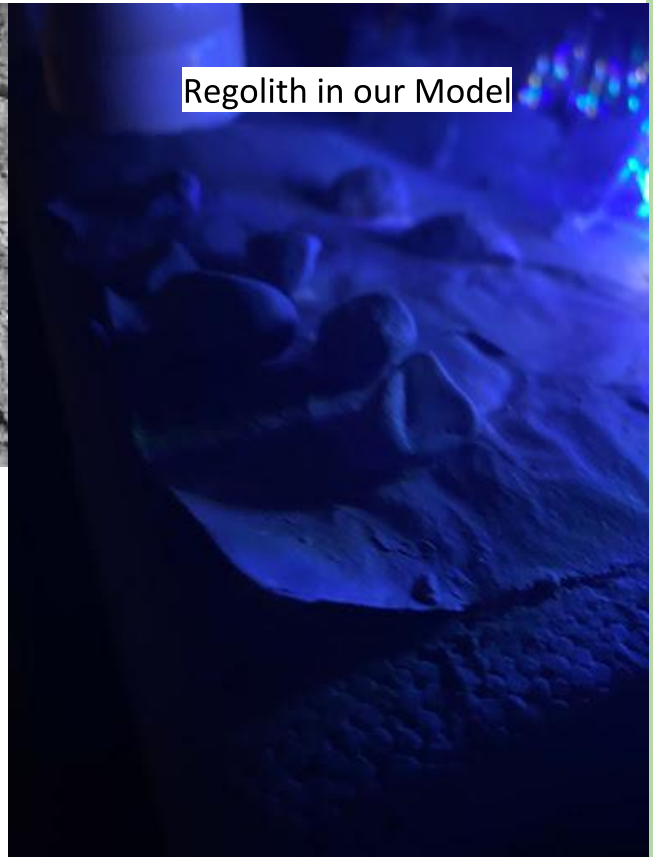
Hydrogen harvested from lunar ice is used as a propellant for our rockets. This rocket is one of our main means of transport to the Space Elevators on Earth. The Space Elevators are tethered satellites that provide a safe method of travelling in space without the need for costly rockets. The portals of the elevator are made of high strength graphene.

Agricultural Structure



The agricultural centers are the main source of food for the civilization. There are two greenhouses: one provides oxygen and foliage with trees and bushes, and another farms the most edible plants such as rhubarb, beans, and potatoes. Cacti are also grown for water and extra air circulation. These green houses give off a marvelous amount of oxygen and food. The greenhouse also supports the cultivation of genetically modified chickens, which are bred for proteins for the civilians' diets.

Living on the Moon (Resource #1) Example 1



Regolith

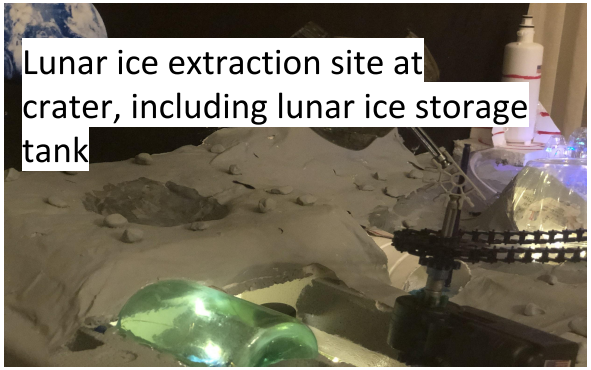
The lunar regolith is abundant on the surface of the moon. It is collected and then placed on the top of all structures located on the Moon's surface to protect them from radiation and micro-meteorites. The regolith also provides the structures with a cheap layer of insulation from the extreme temperatures.

It is also used in the foundation of buildings because regolith is very sturdy. Throughout our model, there are many places found that have small rocks or a smooth coating on them; this is all regolith.

Living on the Moon (Resource #1) Example 2

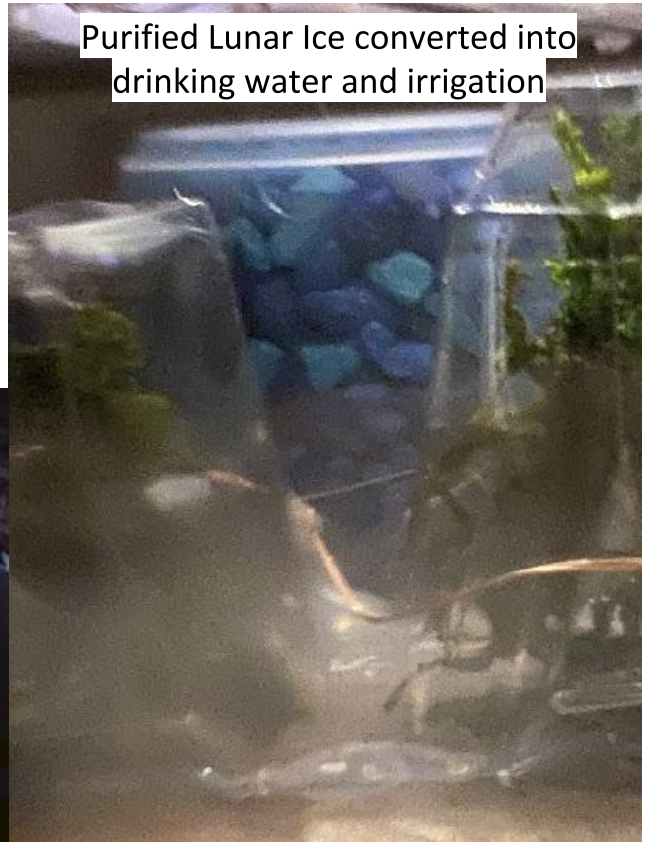
This part of our model is the transportation of lunar regolith. The regolith is transported from the mines to processing plants where rare earth elements such as Helium 3 can be extracted, or to 3D printing factories. Helium 3 is abundantly available in the regolith, and is a key component in the city's high efficiency fusion plants that provide additional power for the city's underground operations. The Helium 3 is shown here before loading onto the rocket for transport back to Earth. These conveyors are used, not just for regolith, but also other metals like titanium and aluminum that are extracted from beneath the lunar surface.

Living on the Moon (Resource #2)



Lunar ice extraction site at crater, including lunar ice storage tank

Real Lunar Ice

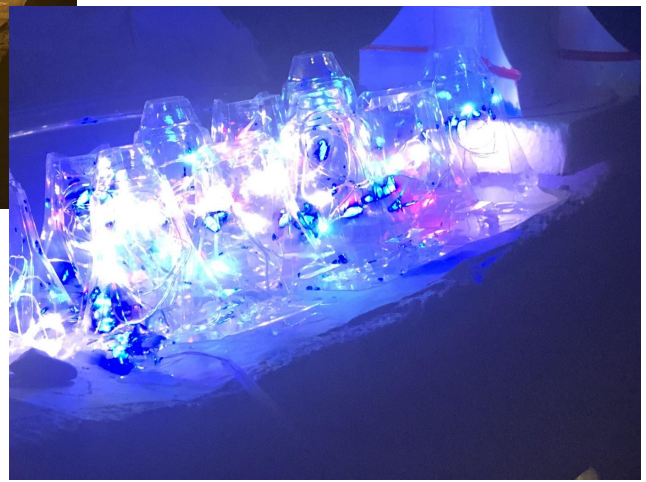


Purified Lunar Ice converted into drinking water and irrigation

Lunar Ice

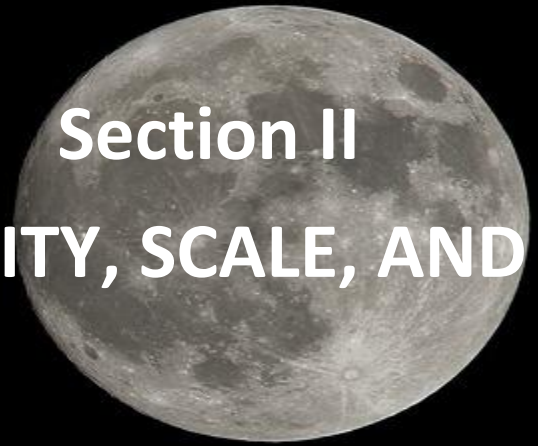
Lunar Ice is found in caves and within craters on the surface of the moon. Crescent City has many mining sites throughout it, and it is used as the major water source for all of our society. In the model, there is a section that has a carton full of lunar ice, waiting to be processed, and ready to be used for showering, drinking, or any other necessary purpose.

Living on the Moon (Resource #3)



Helium 3

The material used here is Helium 3. This is a isotope that is abundant on the moon, but extremely scarce on Earth. This is beneficial to Crescent City, as sending Helium 3 to earth is one of our major sources of income. The substance in our model is shown next to a ship that is about to bring tanks of Helium 3 to Earth.



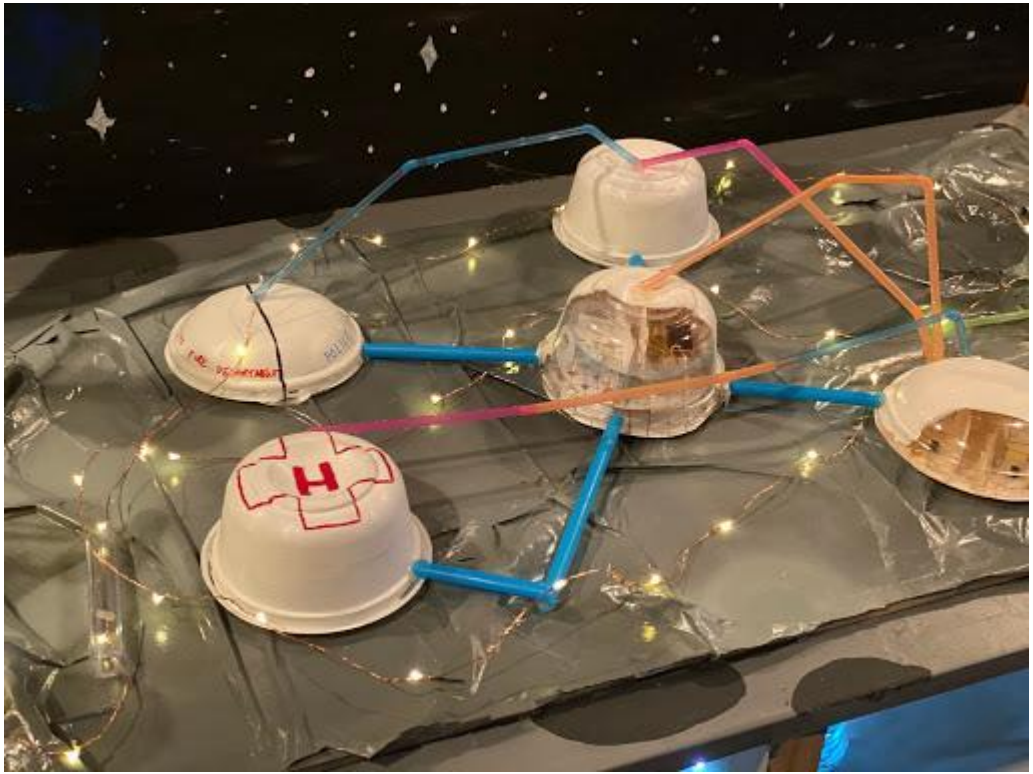
Section II

BUILD IT: QUALITY, SCALE, AND MATERIALS

Innovative Material & Use Example 1

We used styrofoam packaging to create the surface of the moon. We shaped the styrofoam as best we could (it was messy!). Afterwards, we covered some of it with papier mache, added pebbles to represent moon rocks, and then painted it.

Innovative Material & Use Example 2



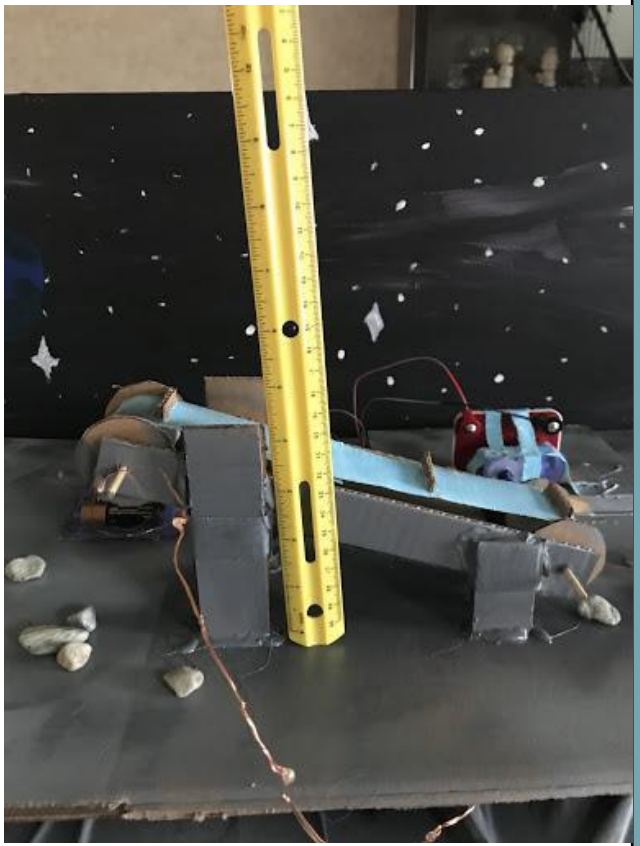
We used containers from Playabowl to create buildings for our commercial zone. These buildings include a school, hospital, police station, grocery store, barber shop, bank, and office space.

Innovative Material & Use Example 3

We used a soda bottle, a bottle cap, and toothpicks for the communication satellite dish. We also used other bottles for various structures and shelters.

Our Hyperloop tunnel was an old plastic hose wrapped in an LED string light. The Hyperloop vehicle was a metal marble that quickly traveled through the model before exiting at the Hyperloop station, which was a bottle lid with a magnet at the bottom to catch the marble.

Example of Scale



Structure 1 is a surface rover. The scale in this structure was 1” = 1’. The rover measures 7 inches and in real life, the rover would be 7 feet.

Structure 2 is a conveyor belt that moves regolith and mined substances. The scale on this structure was 1” = 10’. The belt measures 4 inches high and 10 inches long. In real life, this conveyor belt would be 40 ft high and 100 ft long.

Example of Scale

Structure 3 is our large satellite dish, which is used to communicate with Earth, and eventually Mars and beyond. The scale in this structure was 1” = 20’. The satellite dish measures 3 inches and in real life, it would be 60 feet in diameter.

Structure 4 is a transport rocket that moves people and material to and from the Moon. The scale on this structure was 1” to 20’. The scale rocket measures 5 inches high. In real life, it would be 100 feet high.

Moving Part

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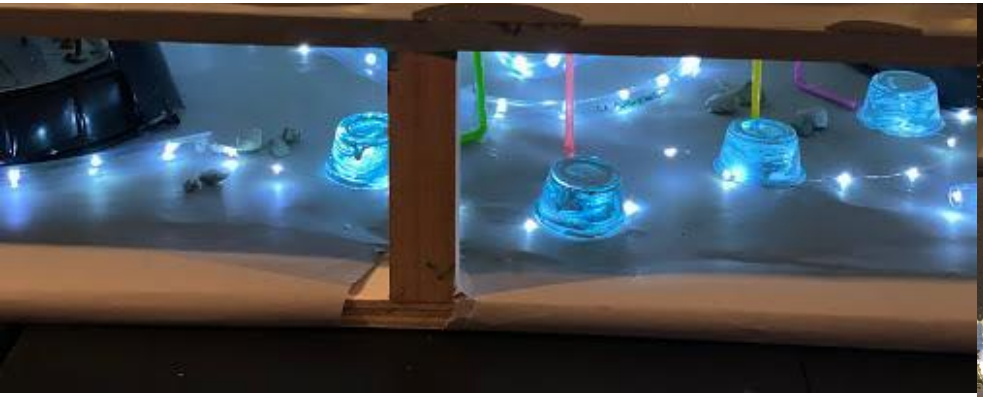
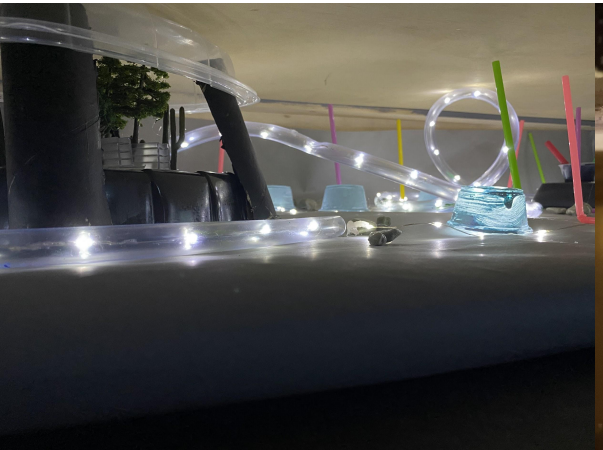
Section III

JUDGE ASSESSMENT OF MODEL

Futuristic Technology Example 1





One piece of futuristic technology in Crescent City is the Mag-Lev Hyperloop Subway. It is an advanced form of transportation for a quick and safe way to travel around the city. With speeds up to five hundred miles per hour, it is better than any car or bus used today.

Futuristic Technology Example 2

Another astro-nomical advancement in the moon society is the Sunflower Tower that produces enough energy for the entire city at once with its solar panels. At a height of a few hundred meters, there is always enough perpetual sunlight to fill Crescent City with light and energy. These towers provide a constant source of sunlight for never-ending energy.