2020-2021 City Model Slideshow

School/Organization: **Queen of Angels Regional Catholic School**

Educator Name: **Julie Gennaro**

Future City Team Name: **Citta Bolla**

Delete all PURPLE text before submitting the slideshow for judging. Keep text that is black.

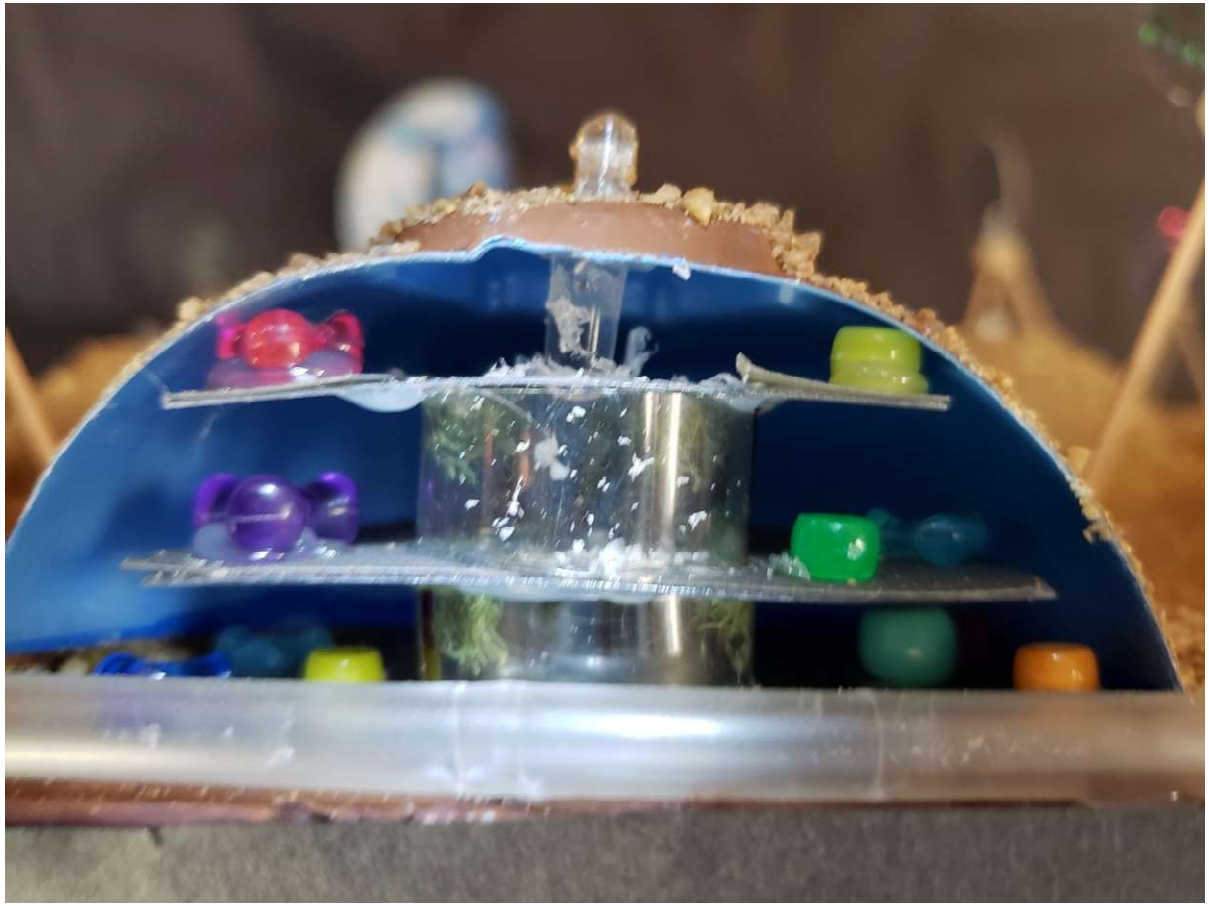
Deliverable Details

- This slideshow is your chance to present your model. Whether your team created a single model or multiple segments, here is where you show off the future city you designed to the judges.
- Choose photos of the various segment(s) that best show the requested content.
- Do not change the size of text boxes in this template. All written text must fit within the boxes and *cannot* be smaller than size 14 in Calibri (or equivalent) font.
- When finished, save the slideshow as a PDF and upload to the Online Portal at FutureCity.org.

Section I

CITY DESIGN

Residential Zone



What is important for the judges to know about your residential zone?:

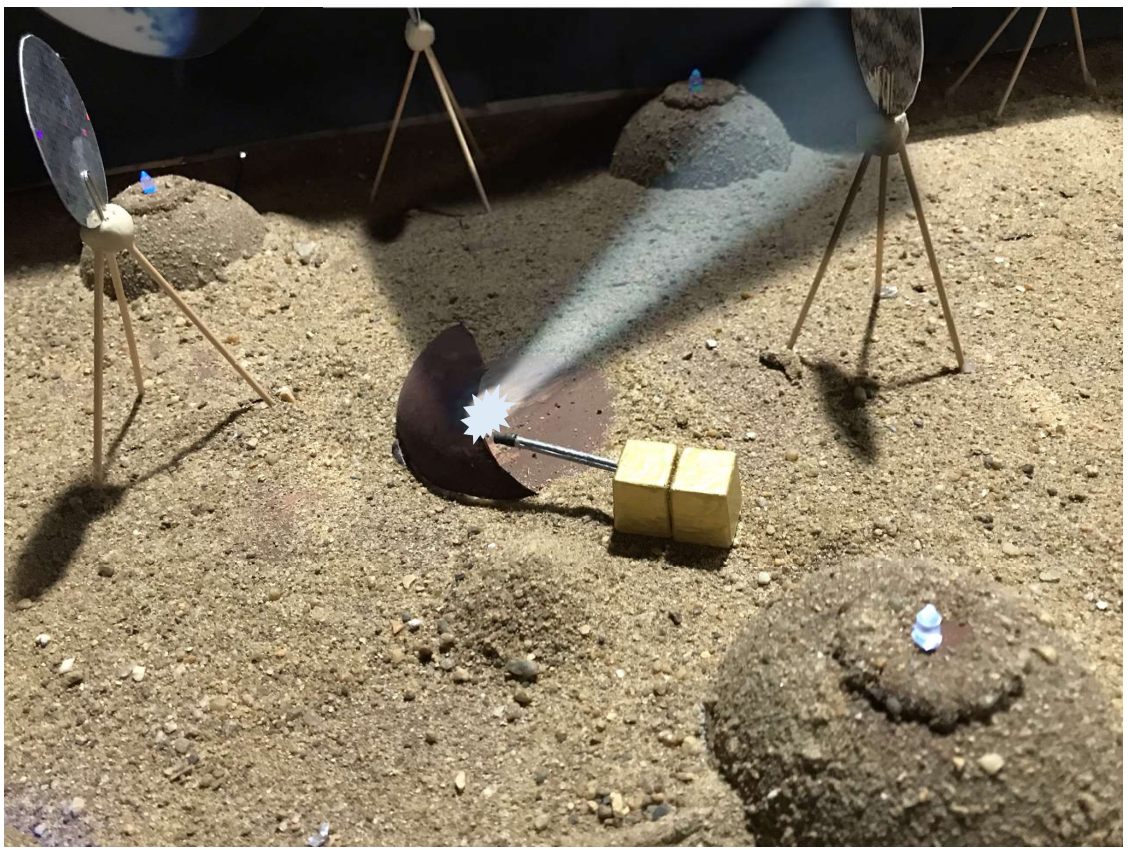
Our residential zone is comprised of 600 Bubbles, designed with Earth-Home features. Each Bubble has five apartments. A common courtyard provides access to other Bubbles and public transportation. Solar energy lights and heats Bubbles through collectors and emitters connected with light pipes. Courtyard palm trees and sunflowers are grown in enriched regolith pots to augment oxygen generation and provide oils required for Citta Bolla's signature cuisine, the Out-Of-This-World Burger.

Commercial Zone

What is important for the judges to know about your commercial zone?:

Our commercial zone is comprised of 60 Commercial Bubbles. Like the residential Bubbles, commercial Bubbles each have five compartments to house shops, restaurants, offices and earth chain outlets. The compartments surround a courtyard with access to the lower level where the tube can be reached for a train ride or a walk to other Bubbles. Sports Bubbles are slightly larger and house artificial gravity rooms, moon dancing studios and a hamster ball soccer field.

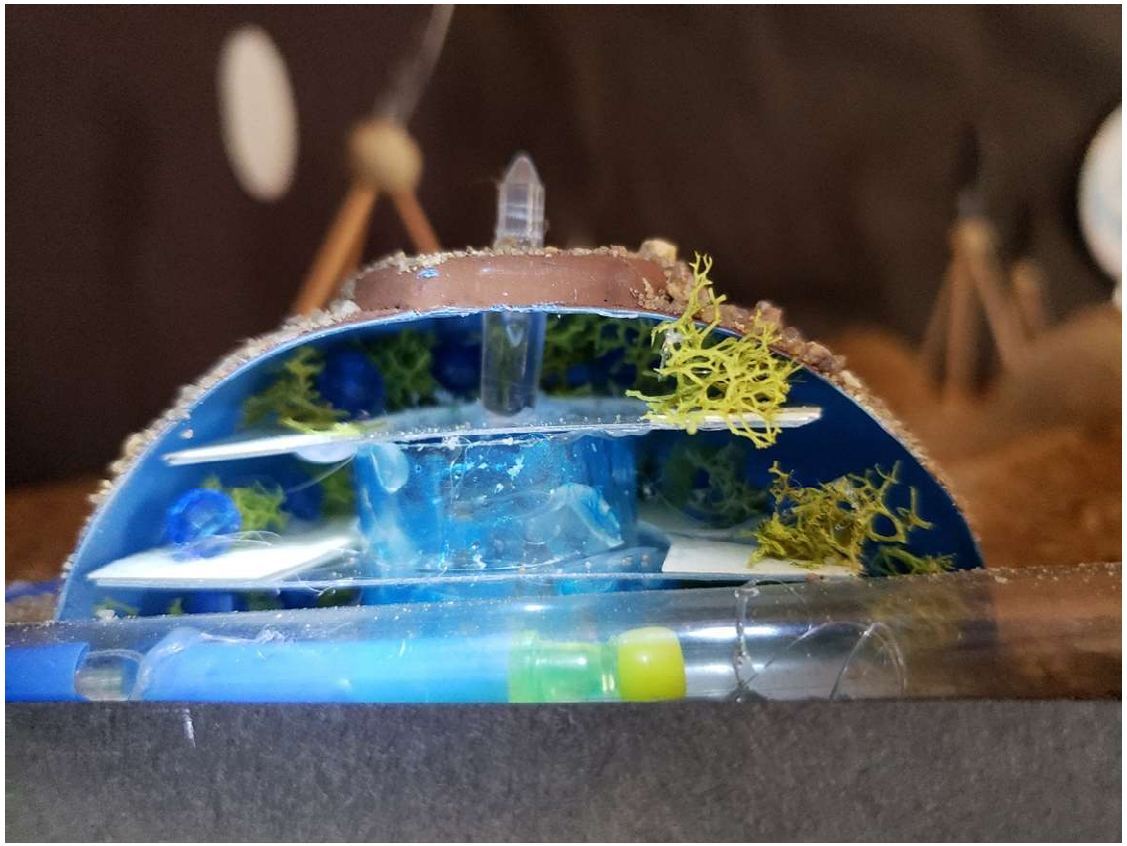
Industrial Zone



What is important for the judges to know about your industrial zone?:

3D Solar Printers are used to construct the shells for the Citta Bolla Bubbles and for structures for interplanetary transportation. The Solar Printer's Extruder directs puffs of regolith along a line for the structure being printed, while the Solar Reflector focuses intense light energy along the same line, melting the regolith. Cooled regolith hardens into a glass like solid, forming the structure.

Infrastructure Example 1



What type(s) of infrastructure are shown here (water, power, utilities, etc.)?:

Our Agricultural Bubbles contain water and waste recycling plants and air scrubbers, along with fruit and vegetable gardens.

How are these related to the realities/challenges of living on the Moon?:

The moon's absence of organic materials and small amounts of water and oxygen make 100% recycling imperative. We transport waste and materials among the Bubbles in tanks inside of the maglev trains. This method isolates failures better than a pipe system would.

Infrastructure Example 2

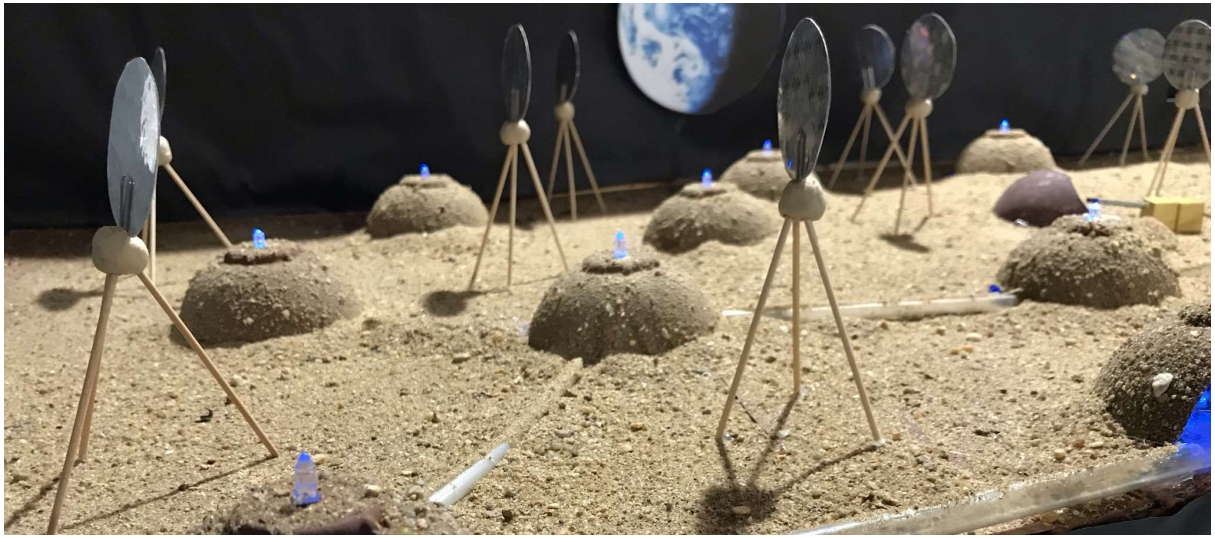
What type(s) of infrastructure are shown here (water, power, utilities, etc.)?:

Citta Bolla makes use of solar energy for heat, light and electricity.

How are these related to the realities/challenges of living on the Moon?:

An array of 200 Solar Reflectors rotate on their towers to always face the sun and to harness solar energy with thousands of tiny, programmable mirrors. This light energy is focused on our Light Collectors or 3D Solar Printers. Light Pipes direct light and heat. Electricity is generated with flexible solar electric arrays wrapped around the Light Pipes. We have spare reflectors for redundancy.

City Services Example 1



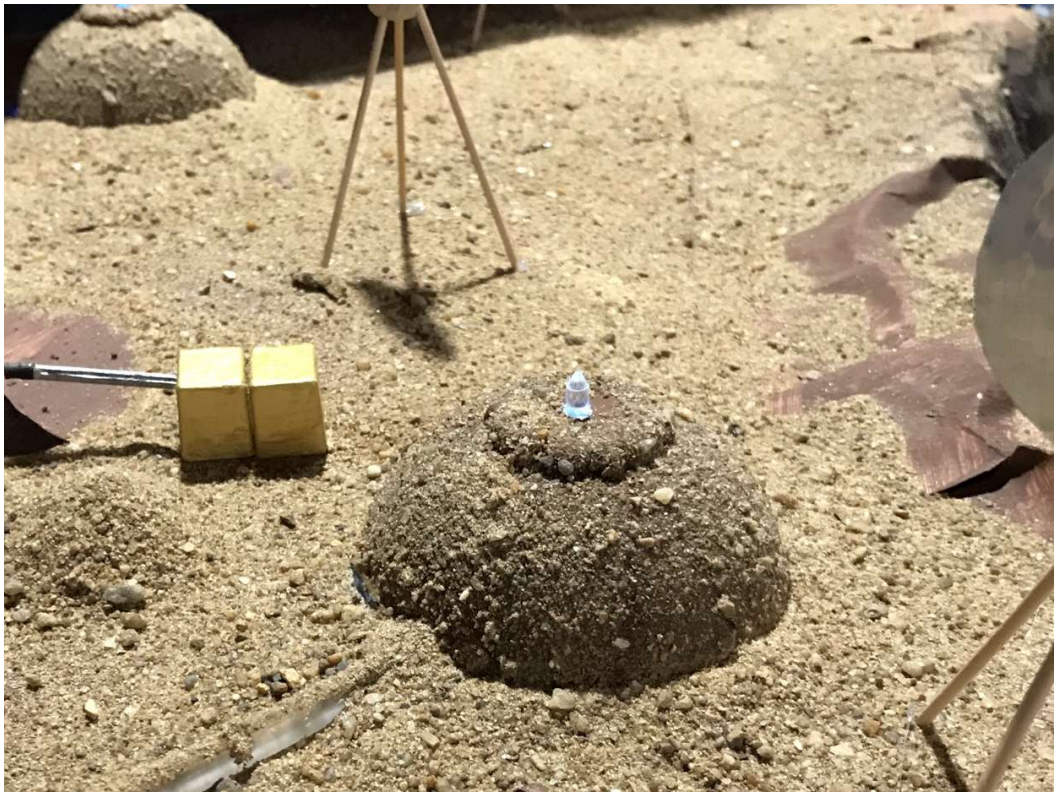
What type(s) of city services are shown here (health, education, etc.)?:

Education, Safety and Communications

What do you want the judges to know about your city's operations?:

Students are taught in Holo-Rooms located throughout the city where three-dimensional holographic images allow students and teachers to interact. Continuous automatic monitoring of all Bubbles protects against fire or atmosphere leaks. Communications use Carta Phones with unlimited service to anyone on earth or on the moon. Carta Phones are paper-thin and unfold to a large viewing screen.

City Services Example 2



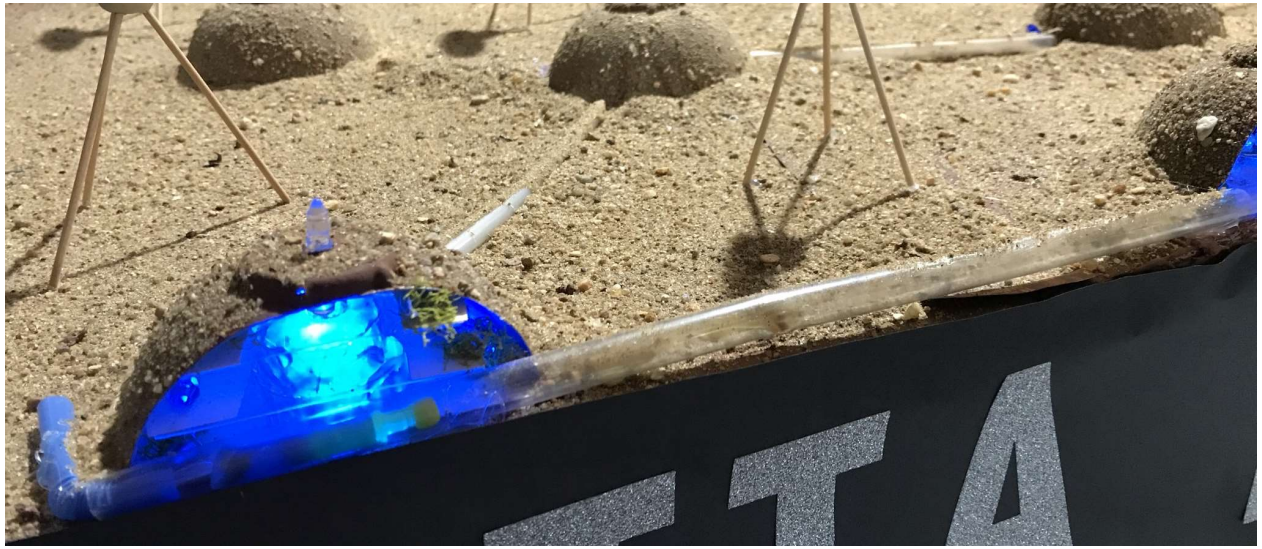
What type(s) of city services are shown here (health, education, etc.)?:

We have five health clinic Bubbles.

What do you want the judges to know about your city's operations?:

With Holo-Rooms located throughout the city, doctors can take care of patients from anywhere. Residents wear a monitor to measure their blood pressure, pulse, oxygen level, and temperature continuously. Citizens with any abnormalities are referred to the in-person Citta Bolla Clinics which also serve as low gravity health research centers.

Transportation Example 1



What type(s) of transportation systems are shown here?:

Maglev Train

What do you want the judges to know about your transportation system(s)?:

Underground maglev trains take citizens between Bubbles. Electromagnets and ceramic coils form magnetic fields which allow the trains to move efficiently. The trains have compartments to transfer water, air and supplies and waste to and from the Bubbles. The maglev also connects to the mining facilities and to the Quench Launcher.

Transportation Example 2

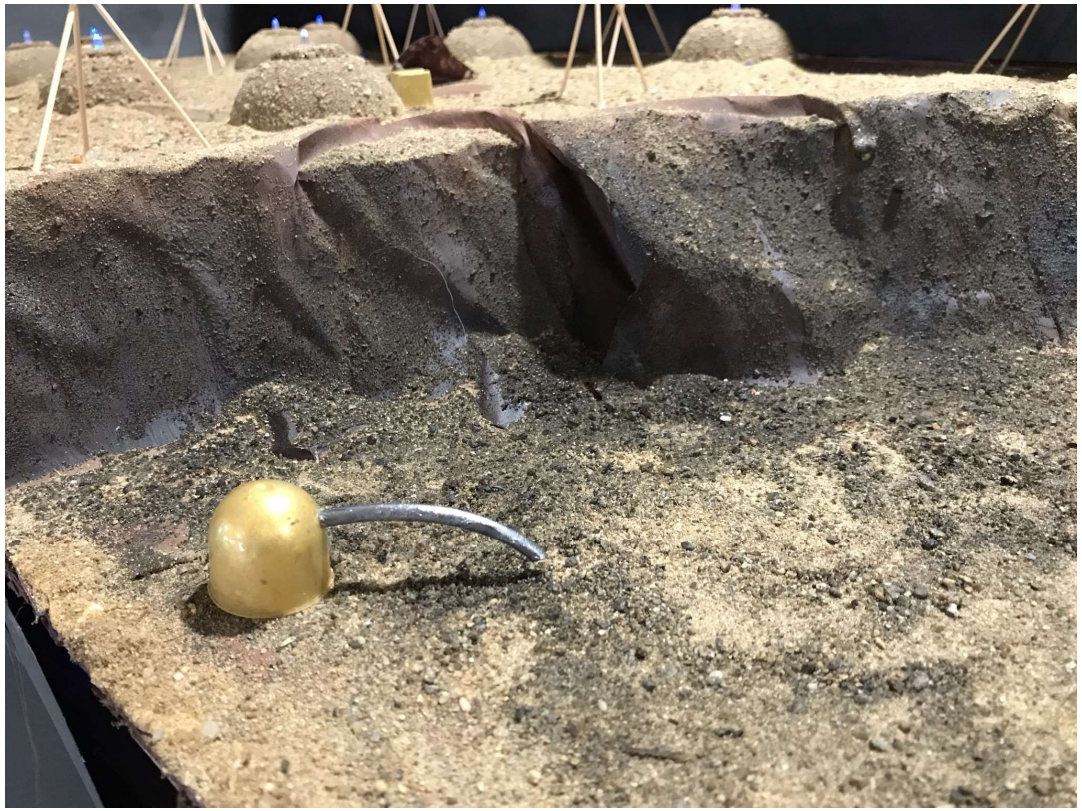
What type(s) of transportation systems are shown here?:

Quench launcher and Quench Car, spherical capsule.

What do you want the judges to know about your transportation system(s)?:

People and goods are transported back to the earth using the Quench Launcher. Located inside the Shackleton Crater, the Launcher uses superconducting coils to generate energy to launch a Quench Car. Always dark, it is so cold that superconducting ceramic coils are practical. The Quench Car accelerates at 3 g's over the length of the Launcher to provide a comfortable return to earth in 3 days.

Living on the Moon (Resource #1) Example 1

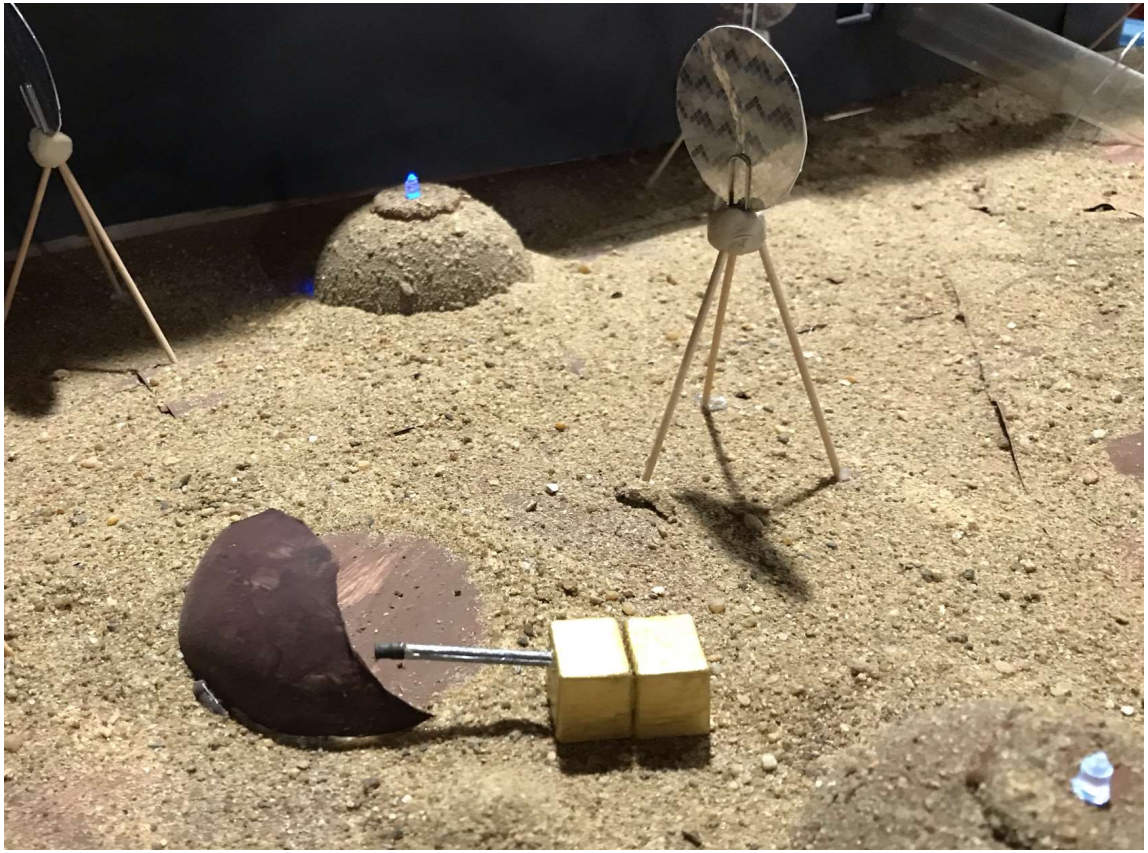


Identify the Moon resource shown here:
Regolith in cold, dark craters, holds water, minerals and metals.

What is important for the judges to know about this resource within your city?:

Mining is accomplished with an Extractor working with the Solar Reflectors. Solar Reflectors aim a burst of solar light energy at the regolith inside a crater, atomizing it. The Extractor collects the atomized material and separates the constituent materials in a centrifuge. Regolith in the dark craters is rich in crystalized water, oxygen, iron, and precious metals, along with silicon.

Living on the Moon (Resource #1) Example 2

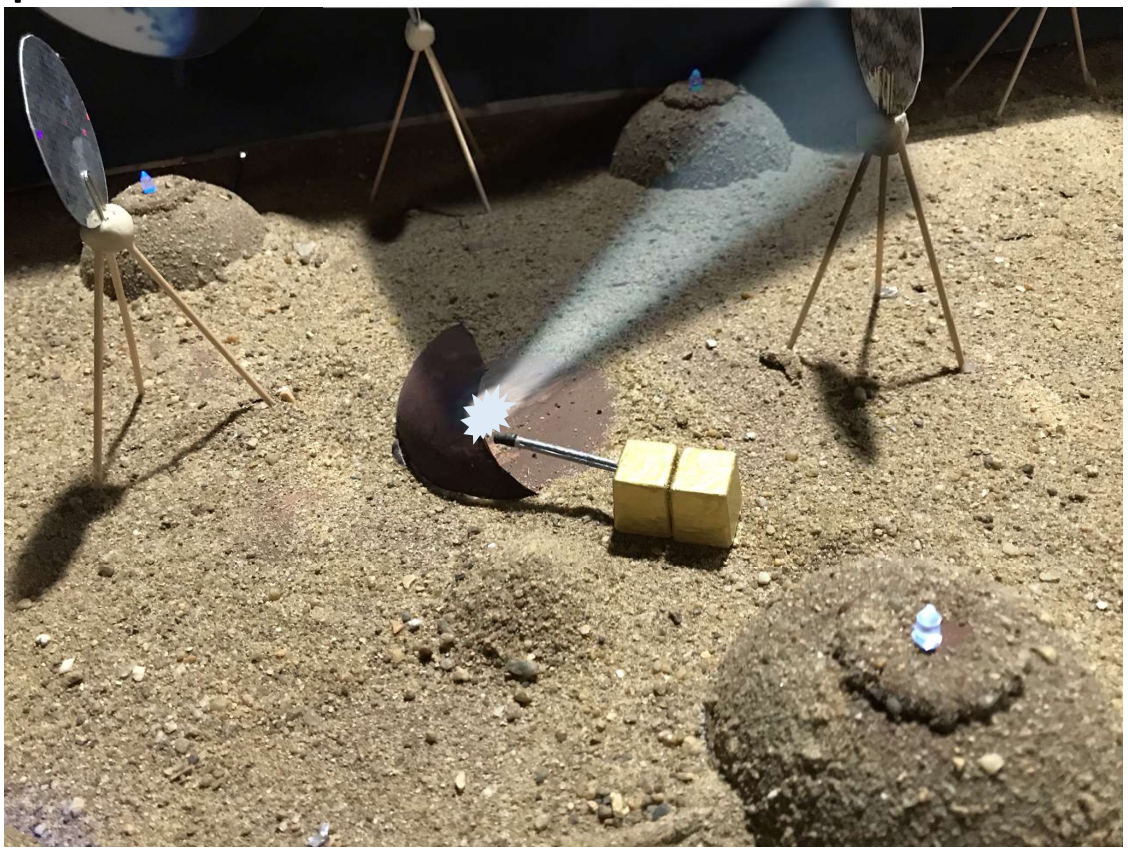


What is important for the judges to know about this element of your model?:

Regolith is used to create structures and to cover and protect them from radiation and meteorites.

The 3-D Solar Printer's Extruder directs puffs of regolith along a line for the structure being printed, while the Solar Reflector focuses light energy along the same line, melting the regolith. Cooled regolith hardens into a glass like solid, forming the structure.

Living on the Moon (Resource #2) Example 1

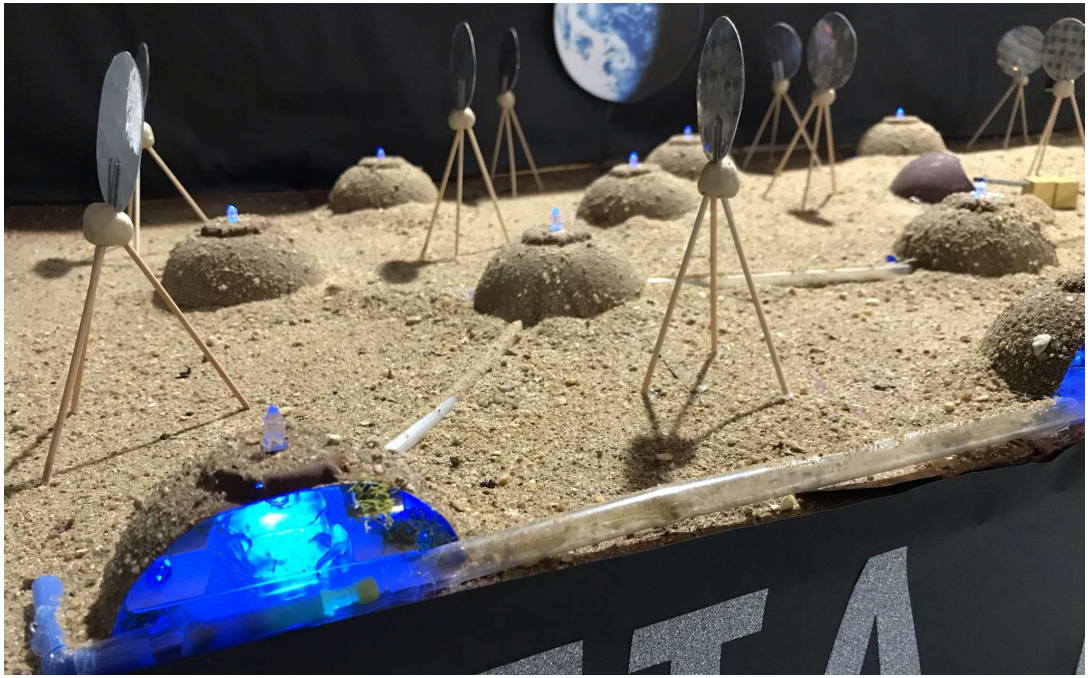


Identify the Moon resource shown here:
Light is available all of the time.

What is important for the judges to know about this resource within your city?:

Each reflector sits on a 60-foot tri-legged structure and is 30 feet in diameter and can focus 99% of that light energy into a point 3 inches in diameter. This creates extremely high temperatures for use in 3-D printing and mining.

Living on the Moon (Resource #2) Example 2



What is important for the judges to know about this element of your model?:

Light is directed from reflectors to Bubbles to provide heat, light and electricity.

Solar Collectors, attached to each Bubble, steer the light from the reflectors into Light Pipes. Solar Collectors split the light beams into several light pipes which are similar to large fiber optic cables. The light pipes direct the solar energy to each compartment, providing heat and light directly. Electricity is created using paper thin arrays of photodiodes wrapped around the light pipes.

Section II

BUILD IT: QUALITY, SCALE, AND MATERIALS

Innovative Material & Use Example 1

Choose one recycled or reused item and describe how you used it creatively in your model:

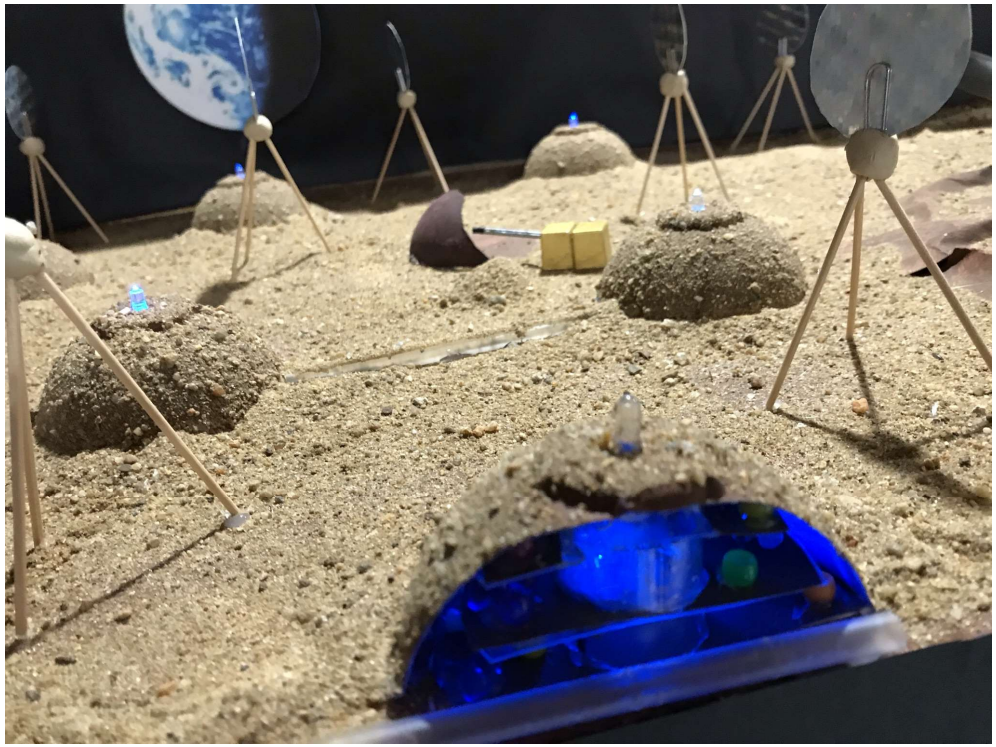
Our Quench Launcher uses a spring taken from an old flashlight, with a piece of a dowel to make a pin ball device to propel the Quench Car, which is a marble.

Innovative Material & Use Example 2

Choose another recycled or reused item and describe how you used it creatively in your model:

Reflectors made from large toothpicks, paper clips, clay and reflective tape.

Innovative Material & Use Example 3

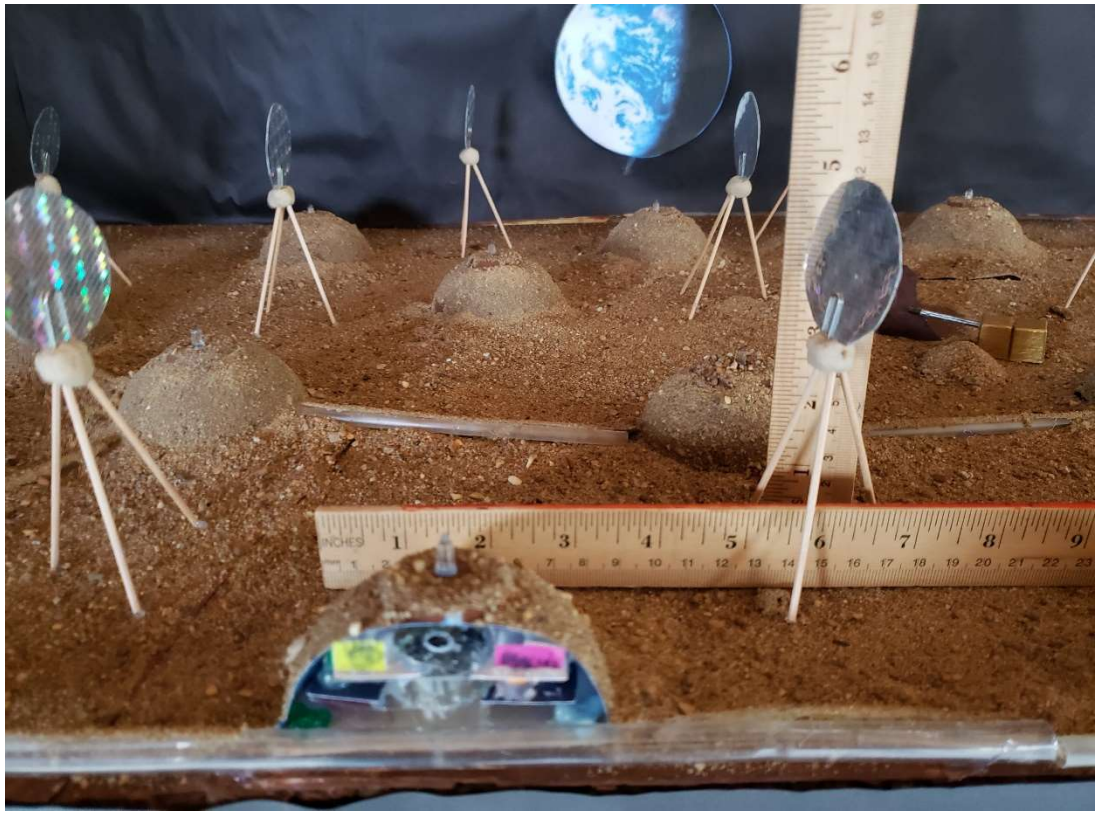


Choose another recycled or reused item and describe how you used it creatively in your model:

The Bubbles are made from plastic tomato holders. They are painted and decorated inside with scrap plastic pieces and beads.

The Sand is ‘borrowed’ from our mentor’s garden supplies.

Example of Scale



Scale used in model (1”= 20’):

Structure 1
What type of structure is this?: Bubble

What size is the structure on the model?: 3 1/4 inches in diameter on the ground, 1 1/2 inch high.
What size would this structure be in real life?: 65 feet in diameter, 30 feet high.

Structure 2
What type of structure is this?: Reflector

What size is the structure on the model?: 5 inches from the base to the top of the reflector.
What size would this structure be in real life?: 100 feet.

Moving Part

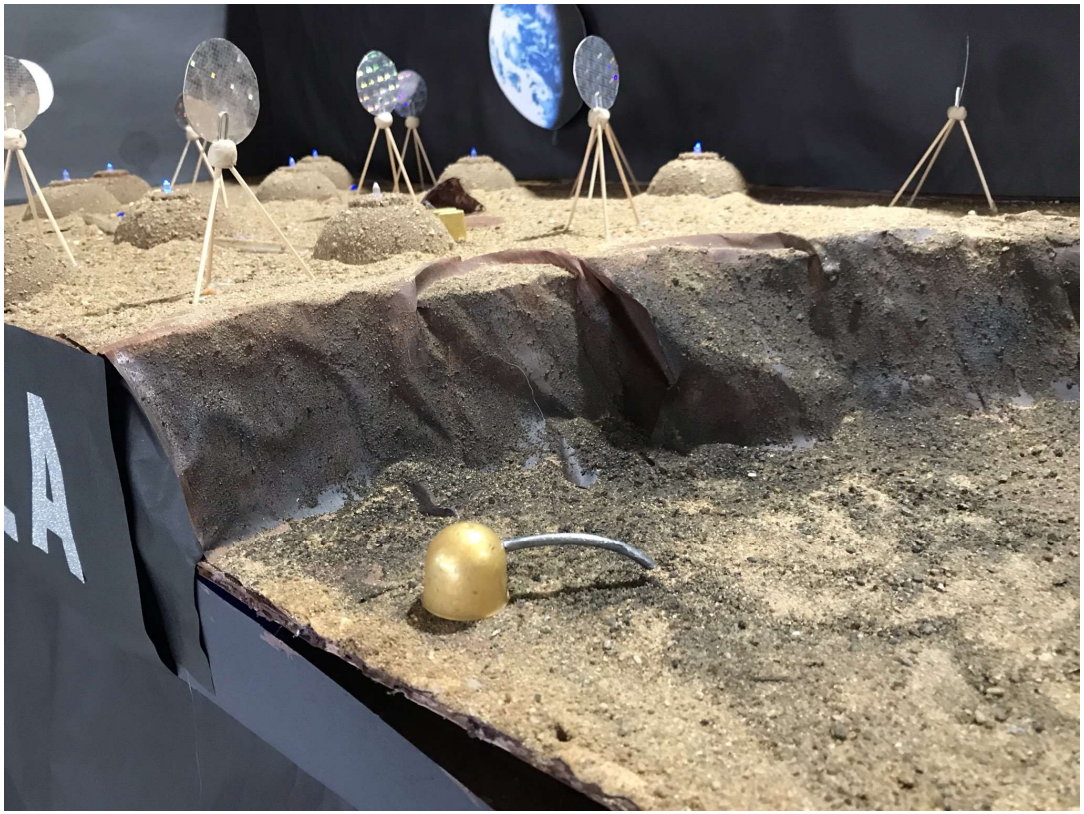
URL link to team's moving part video:

https://youtu.be/K-QRJYc5fK4

Section III

JUDGE ASSESMENT OF MODEL

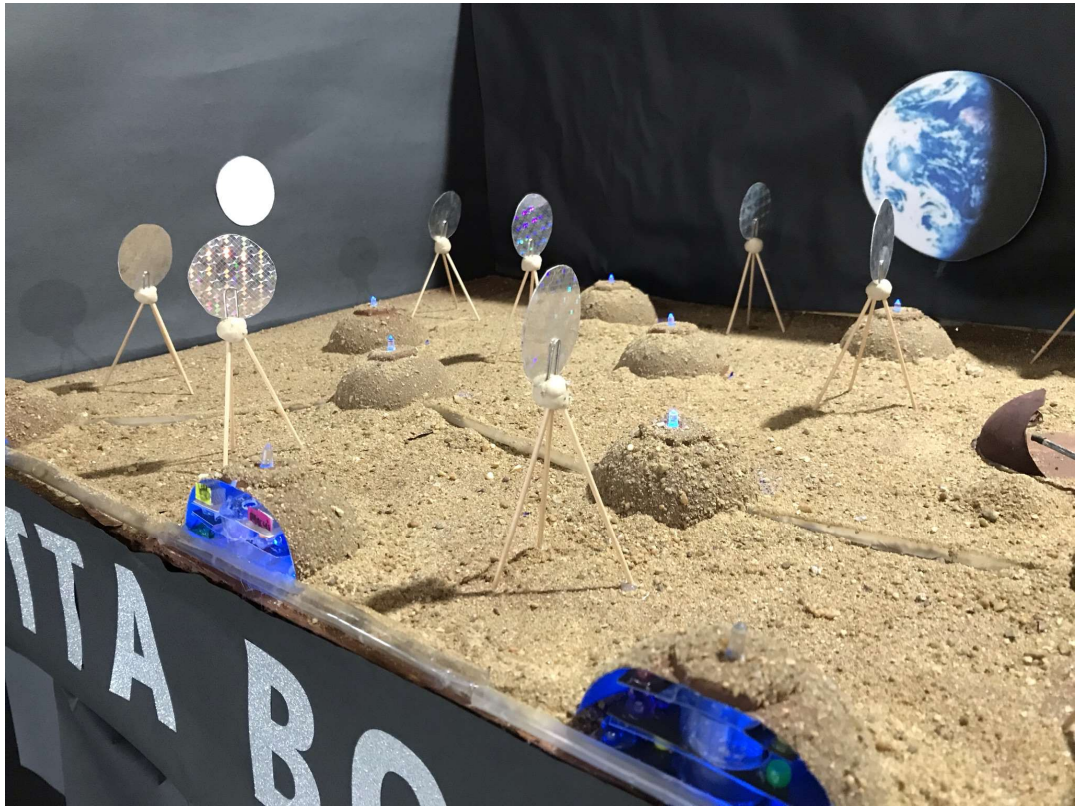
Futuristic Technology Example 1



What is important for the judges to know about this example of technology?:

Mining is accomplished with an Extractor working with the Solar Reflectors. Solar Reflectors aim a burst of solar light energy at the regolith inside a crater, atomizing it. The Extractor collects the atomized material and separates the constituent materials in a centrifuge. Regolith in the dark craters is rich in crystalized water, oxygen, iron, and precious metals, along with silicon.

Futuristic Technology Example 2



What is important for the judges to know about this example of technology?:

Citta Bolla makes use of solar energy using an innovative combination of Solar Reflectors, Light Pipes, and integrated solar electric power generation. Solar Reflectors rotate on their towers to always face the sun harnessing solar energy with thousands of tiny, programmable mirrors that all tilt to focus light to a point. This light energy is focused on our Light Collectors or 3D Solar Printers and is switched between users so that one reflector can service up to five Bubbles. 200 Solar Reflectors give us redundancy to account for shading and in case of a disaster, like being hit by asteroids.