2020-2021 City Model Slideshow

School/Organization: **Saint Hilary School**

Educator Name: **Kim Kelley**

Future City Team Name: **Eclipse's Edge**

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

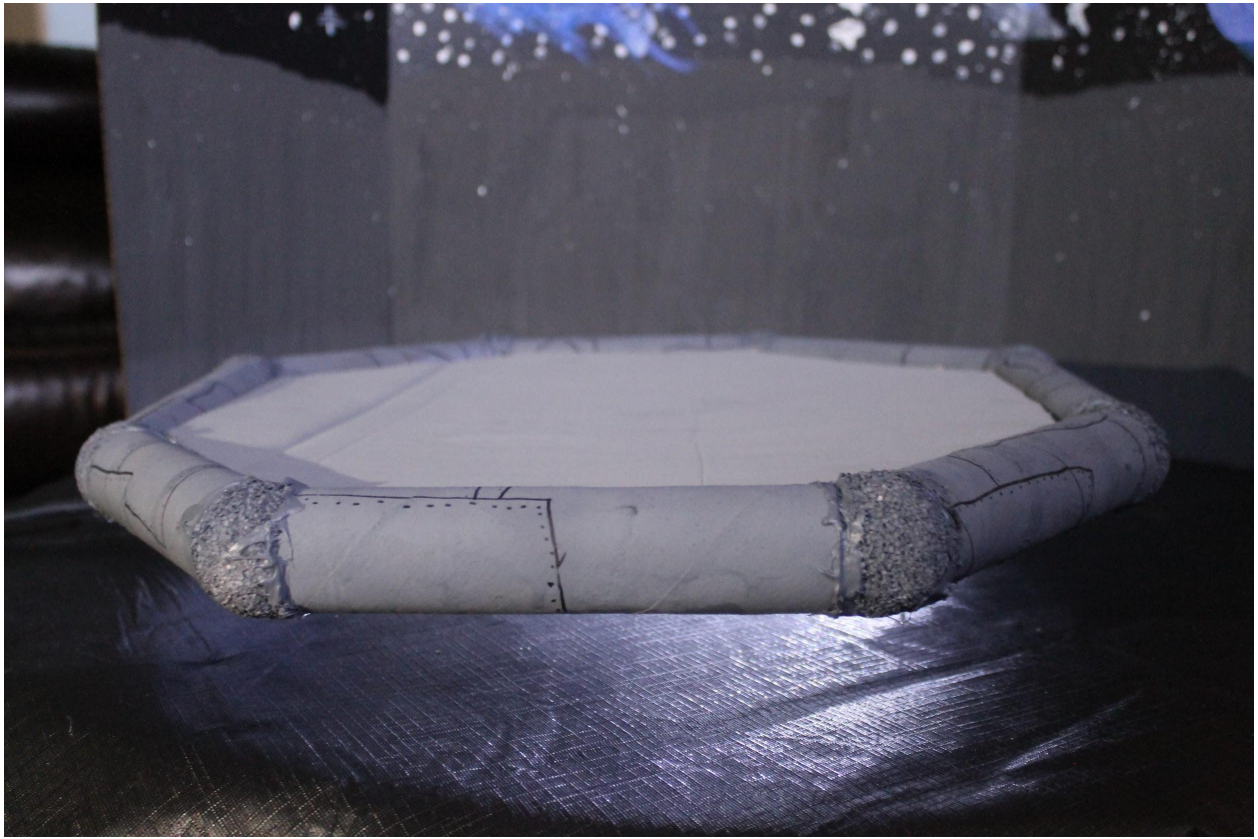
Deliverable Details

- 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

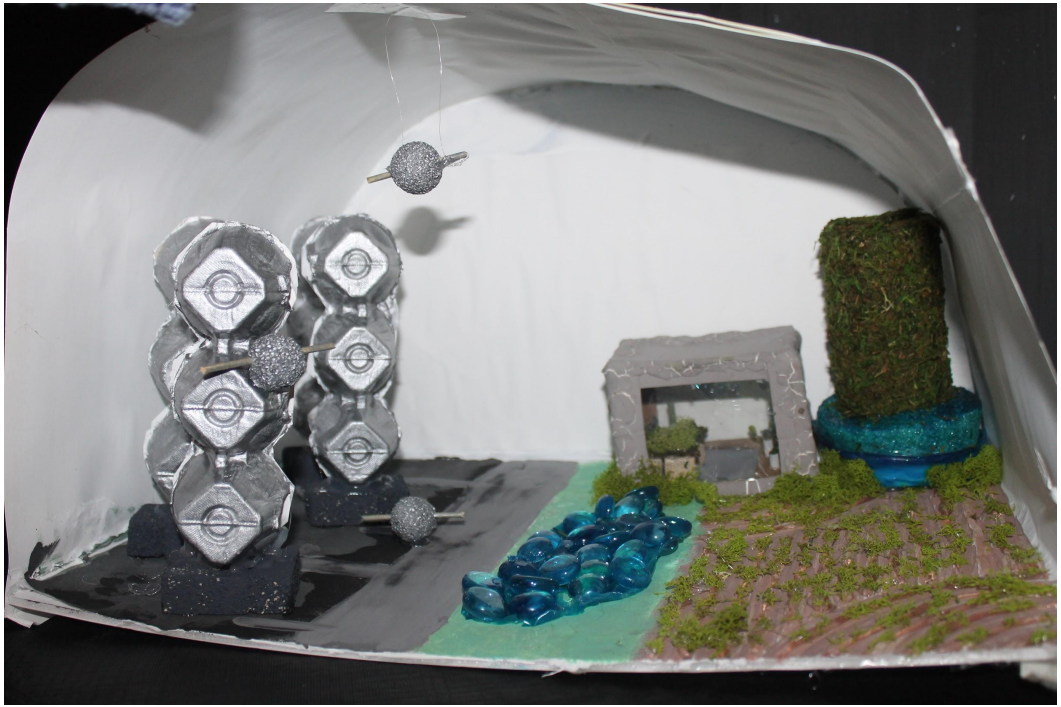
Residential Zone



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

Pods are mixed-use, double-hulled, anorthite, pressurized, trenched and shielded by regolith, at the base of the crater that rotate at 1RPM on a maglev track, using magnetic bearings. The size of the track and speed of rotation were calculated for maximum comfort, to simulate artificial gravity using tangential and angular velocity, radius, and centripetal acceleration. Pods hold 5K people and are powered by wireless, electromagnetic power transfer from the crater rim solar farm. Exit from the pod is via a tram on a concentric track, that matches pod speed and links. ~~Scale: 1'=250'~~

Commercial Zone



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

Pods are mixed use residential and commercial. Off pod, mainly the lava tubes, is where pressurized commercial warehouse overflow storage is located. Transfer of goods from storage is via drone or rover. The on-Pod commercial sector has a variety of permitted uses such as; grocery, restaurants, arts and entertainment, healthcare, childcare and recreational facilities, office space, retail businesses, educational and childcare facilities, and repair sites. Prohibited in this zone are manufacturing facilities, large scale hydroponic and vertical farming, and laboratories. 1”=6’

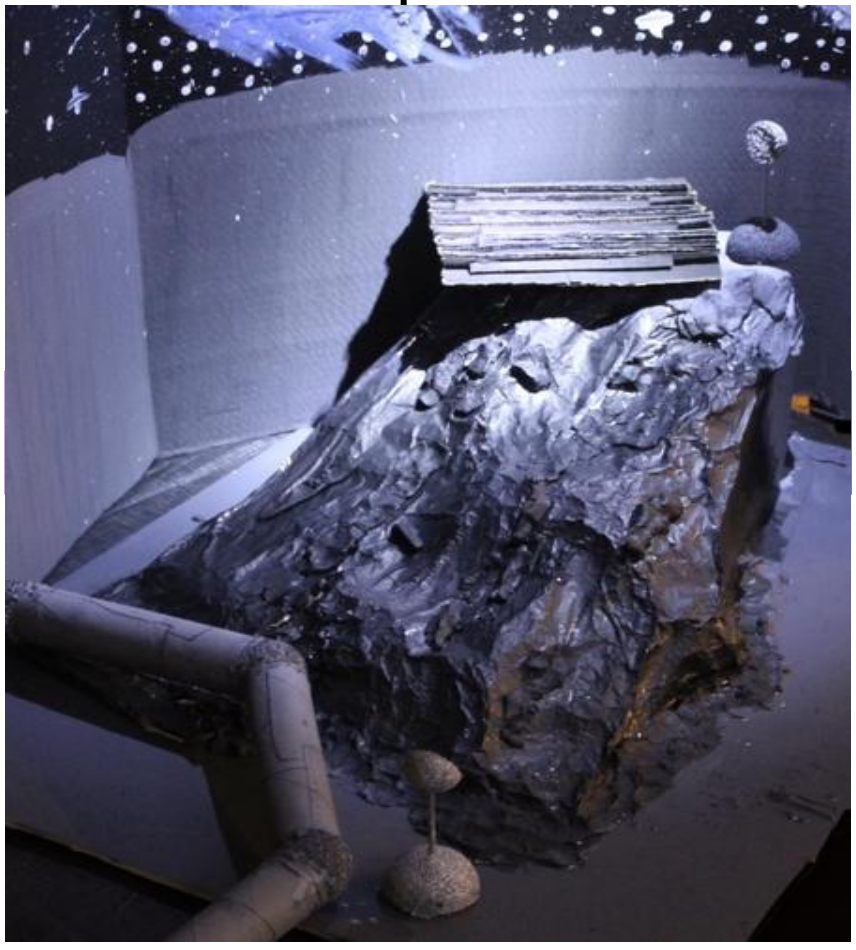
Industrial Zone

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

Both Regolith and Helium 3 are mined in this zone. Helium 3 is mined using a solar powered processor that collects and sifts regolith, heats the particles to 700 degrees C by flowing it over pipes. Helium 3, Oxygen and Hydrogen are separated and collected. Oxygen and Hydrogen are used to provide breathable air, water and fuel, and Helium 3 is used as fuel and as a major export. Mining is done by autonomous machines to mitigate health risks associated with this toxic dust.

Scale: ¼”=1’

Infrastructure Example 1



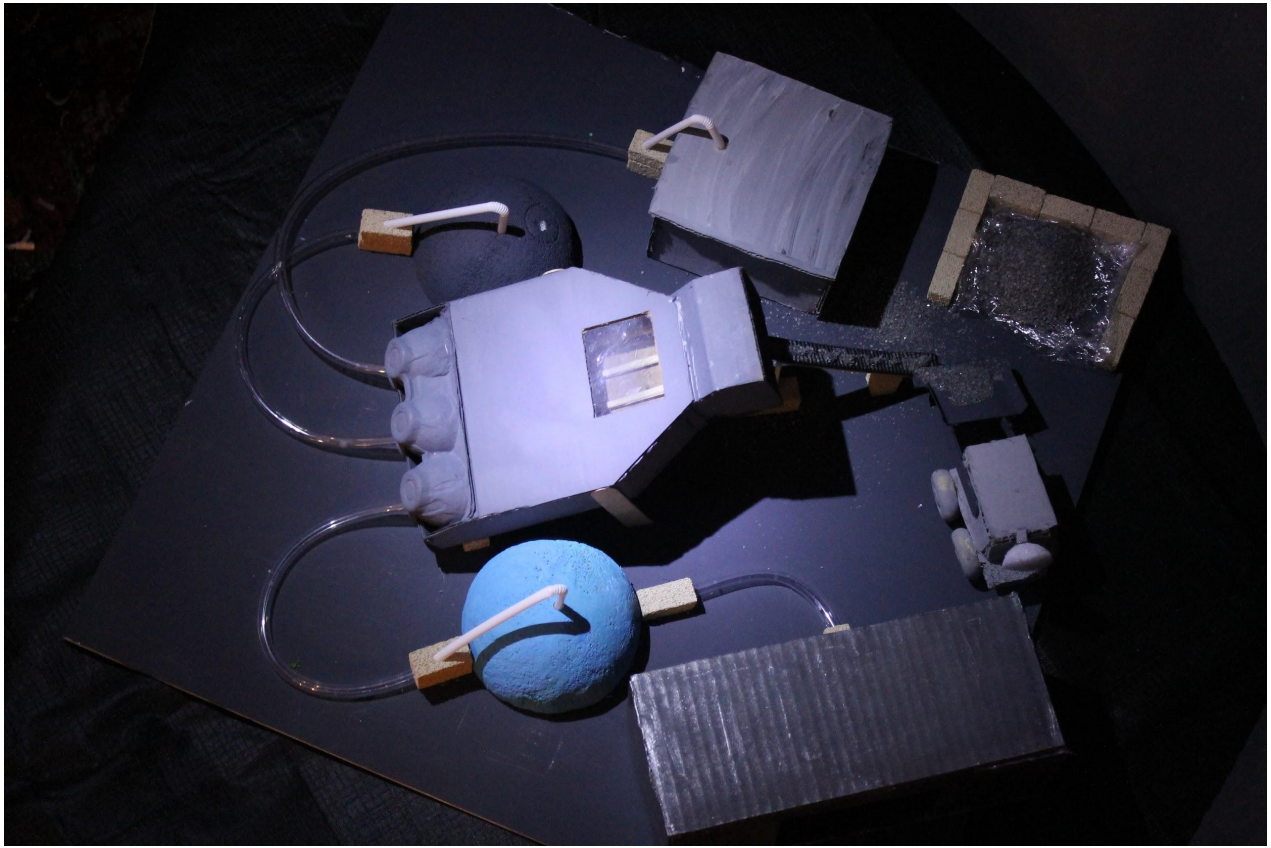
What type(s) of infrastructure are shown here (water, power, utilities, etc.)?:

Solar Energy Production

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

With a 354 lunar night, the sunlit areas on the rim of the crater are prime locations for solar farms to produce perpetual power, a necessity for survival without the enormous expense of additional power technology. Also, the near constant temperatures in these sunlit areas means easier thermal control. Wireless electro magnetic power transfer allows for greater spatial freedom.

Infrastructure Example 2



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

Water

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

Water, present on the Moon but trapped as a solid in regolith in Permanently Shadowed Regions is harvested as "grains" and sorted into water crystals, metals and silicates using infrared technology, a solar process that uses very little energy. Water crystals are taken to the water processing plant to making potable water. Scale: 1"=2.5'

City Services Example 1

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

Health

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

Eclipsians use wearable devices that collect and analyze data on individual health. In addition, data collected is used to monitor population health to help ensure a safe living environment for all citizens. Monitoring takes place on-Pod, in state of the art facilities. Artificial Intelligence provides additional assistance with healthcare decision making.
Scale: 1"=2'

City Services Example 2

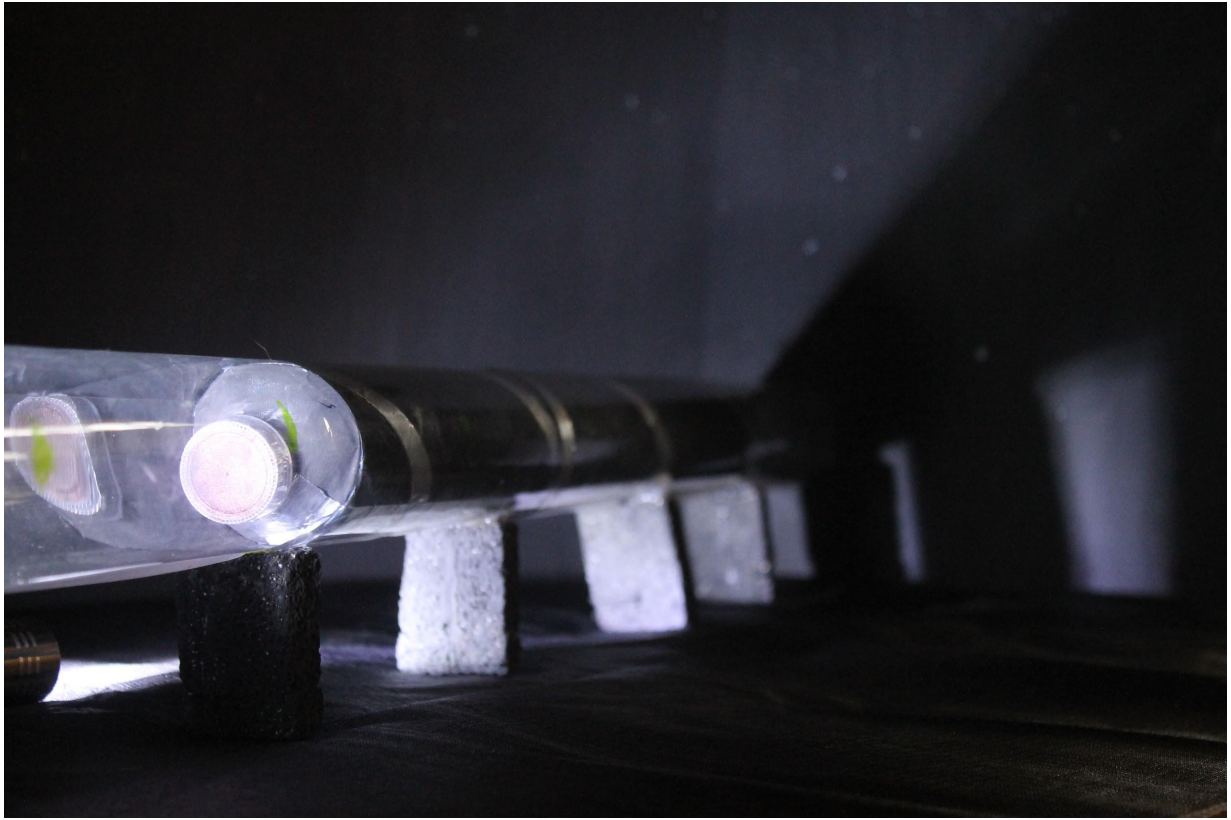
What type(s) of city services are shown here (health, education, etc.)?:

Police and Fire

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

Police and Fire safety personnel monitor facilities on and off-pod in state of the art monitoring stations, using Artificial Intelligence and biometrics. Drones are used to assess situations to determine necessary response. Robots patrol, surveil, troubleshoot and answer questions. An advanced fire suppression system exists, designed to protect the ventilation system. Scale: 1"=2'

Transportation Example 1



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

Hyperloop

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

Eclipsians use a Hyperloop for transport outside of the city proper, to lunar outposts and the Mare region. It's one of three forms of transportation off-pod and it operates via solar on a magnetic levitation track in a vacuum tube and uses magnetic bearings ideal for the lunar environment because they function well in a vacuum, are wear free, require no lubrication, and are low friction. Scale: 1"= 6'

Transportation Example 2

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

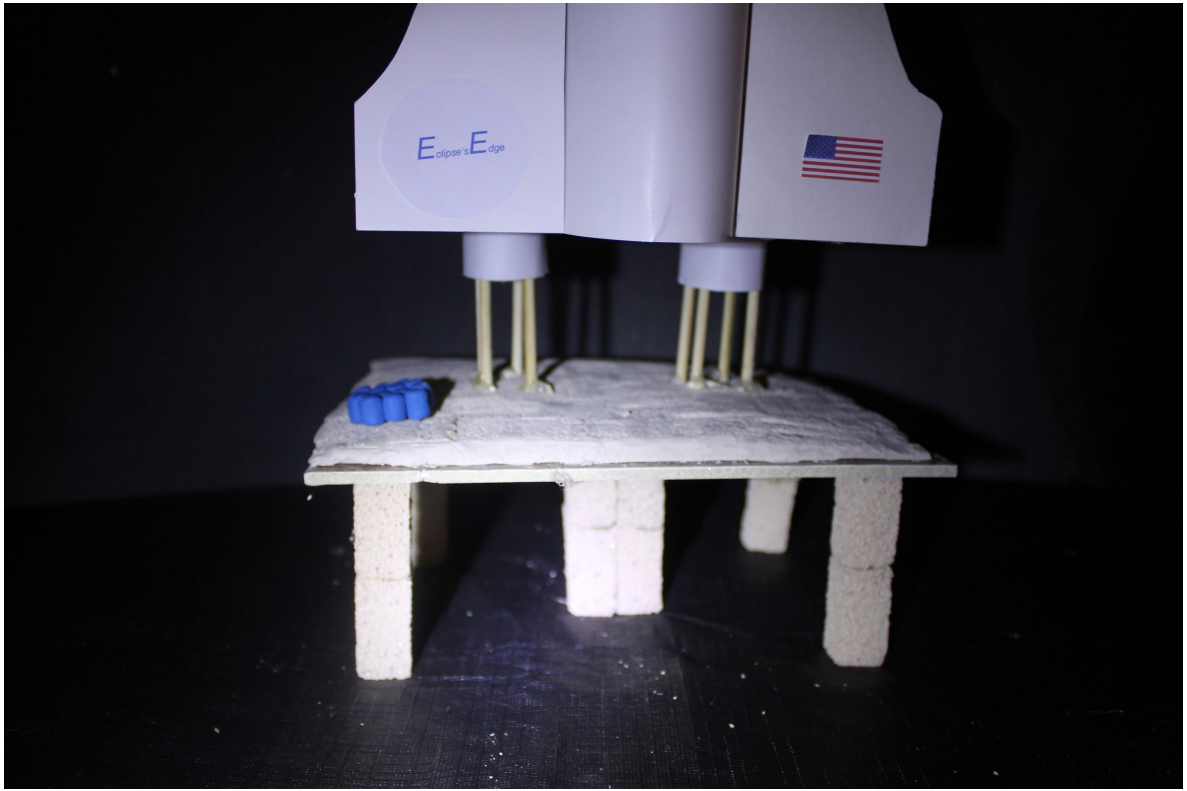
Cable Car

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

Cable cars are an off-pod form of transportation ideal for mitigating dust while moving throughout neighborhoods, avoiding surface obstacles, as well as scaling mountainous terrain. Spans are large between supports, which are made of sintered regolith, and reinforced by titanium. Cars are pressurized.

Scale: 1”=8’

Living on the Moon (Resource #1) Example 1



Identify the Moon resource shown here:

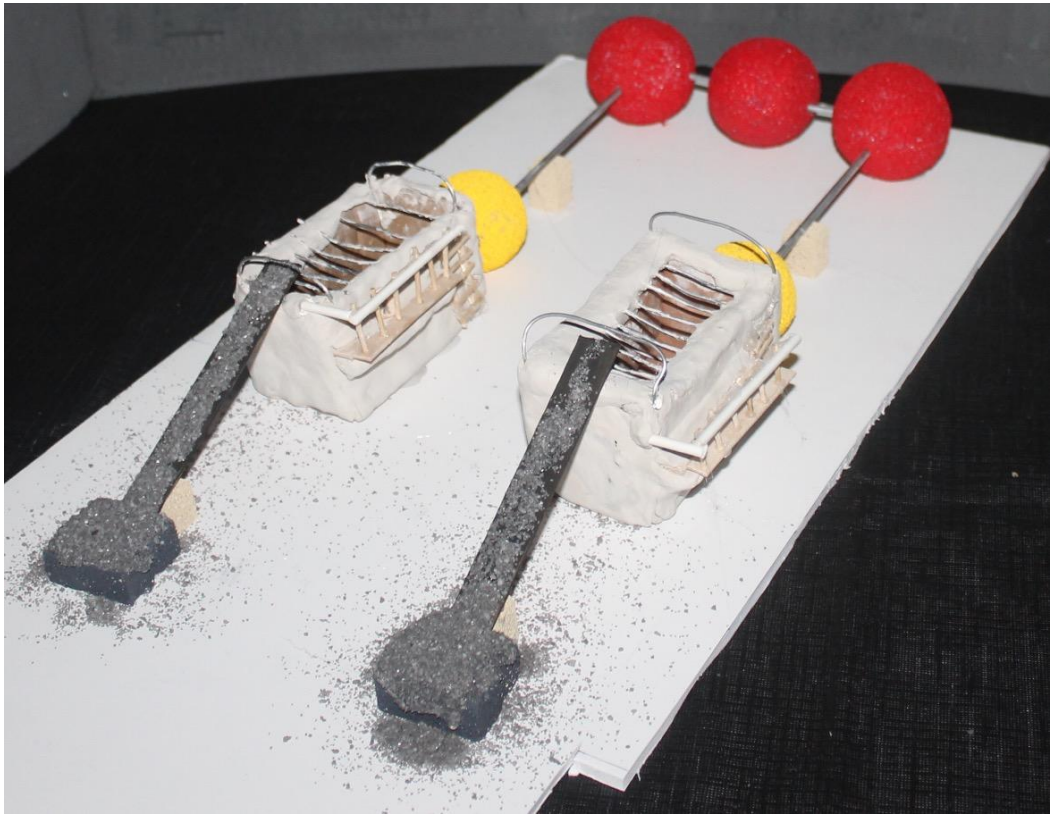
Regolith Construction Aggregate (launch pad/blast wall)

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

Construction aggregate is an extremely valuable resource. Sintering technology is used, in which mined regolith is heated using microwave technology, powered by solar. The sintered regolith can be used to build launch pads, blast walls, roads, etc. An added benefit is that building materials contribute to dust mitigation through their use.

Scale: 1”=12’

Living on the Moon (Resource #1) Example 2



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

Regolith as Oxygen

Molten Salt Hydrolysis is used to produce Oxygen directly from regolith, an abundant resource. This provides citizens with breathable air, which is non existent, as well as rocket fuel. Lunar regolith is made of 40-50% oxygen. This process releases oxygen in a usable form, with a byproduct of useful metal alloys that are used as construction aggregate. The plant operates using solar.

Scale: 1”=15’

Living on the Moon (Resource #2) Example 1

Identify the Moon resource shown here:

He3 as Rocket Fuel

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

Helium 3 is a valuable resource to this city because of its use in fusion rocket propulsion. Its abundance on the Moon provides Eclipsians with a limitless and extremely efficient fuel source for frequent and necessary spaceflight. The on board fusion reactors have been designed to be smaller and lighter than original fusion reactors.

Scale: 1”=12’

Living on the Moon (Resource #2) Example 2

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

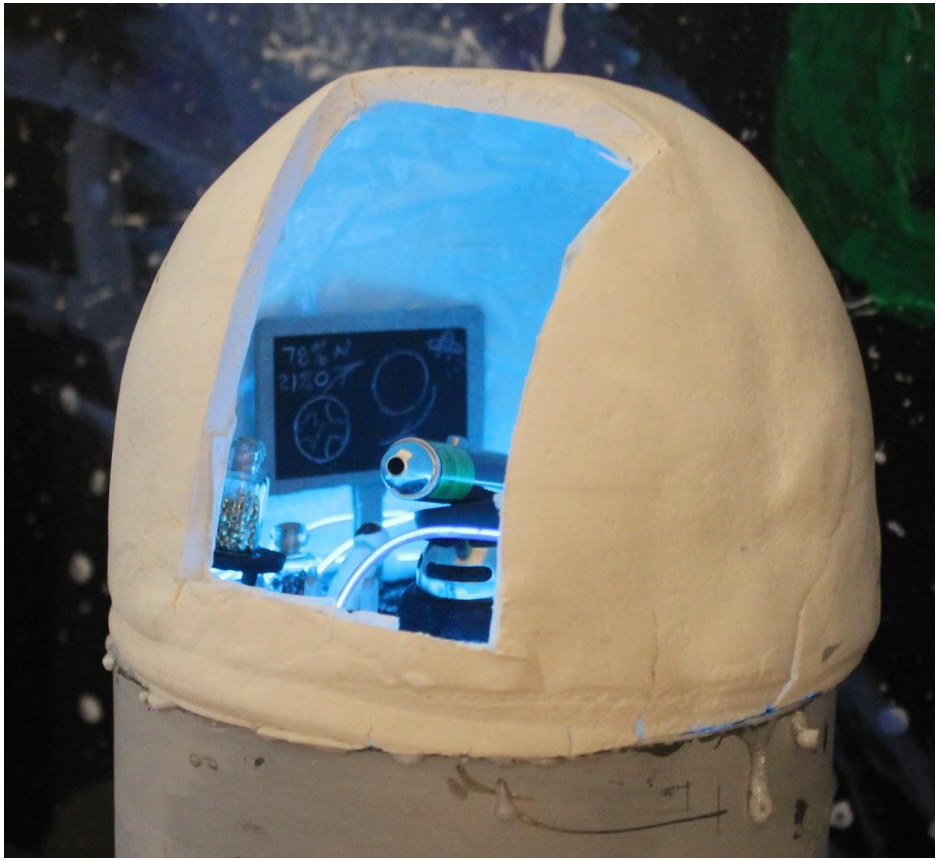
Helium 3 as a Major Economic Resource

The export of Helium 3 is the major Economic Resource of Eclipse's Edge. Mining of He3 and returning it to Earth for use as a fuel for nuclear fusion provides a vital green energy alternative on Earth, which has done significant damage to itself through its long term reliance on fossil fuels. This has created an enormous opportunity for our city to achieve economic stability. Pictured here is Eclipse Energy ringing the bell to celebrate its listing on the New York Stock Exchange.
Scale: 1"=18"

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:

The interior of the Lunar Observatory uses a laser pen key chain as the high powered telescope at the Eclipse's Edge Lunar Observatory. The laser is attached to a magnet, which anchors it to a ball bearing, that is anchored to the observatory floor. The pen can be moved around on the bearing to represent the telescope moving around in the observatory.

Scale: ⅛"=1'

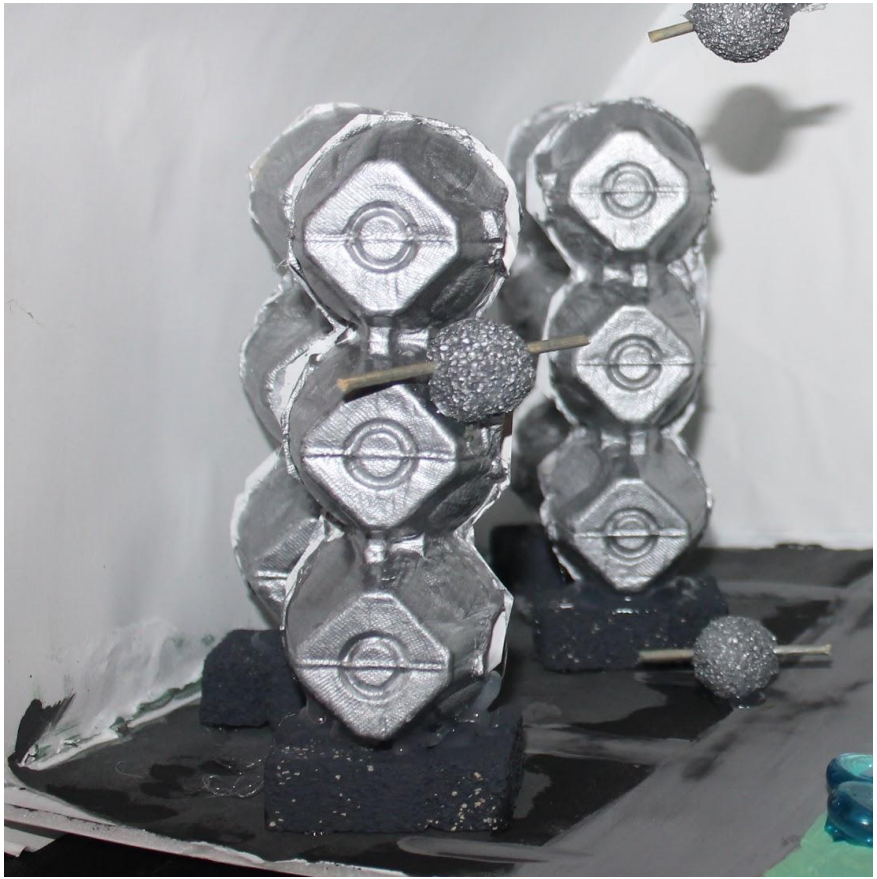
Innovative Material & Use Example 2

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

Lamp sockets were used to simulate laser bee components. The socket was modified to accommodate a cardboard disk, which was attached to the light bulb end with glue. A wire was wrapped around the base of the socket and the entire structure was then suspended to simulate a single laser bee in a swarm, intercepting an incoming projectile.

Scale: 1”=3’ for bee

Innovative Material & Use Example 3

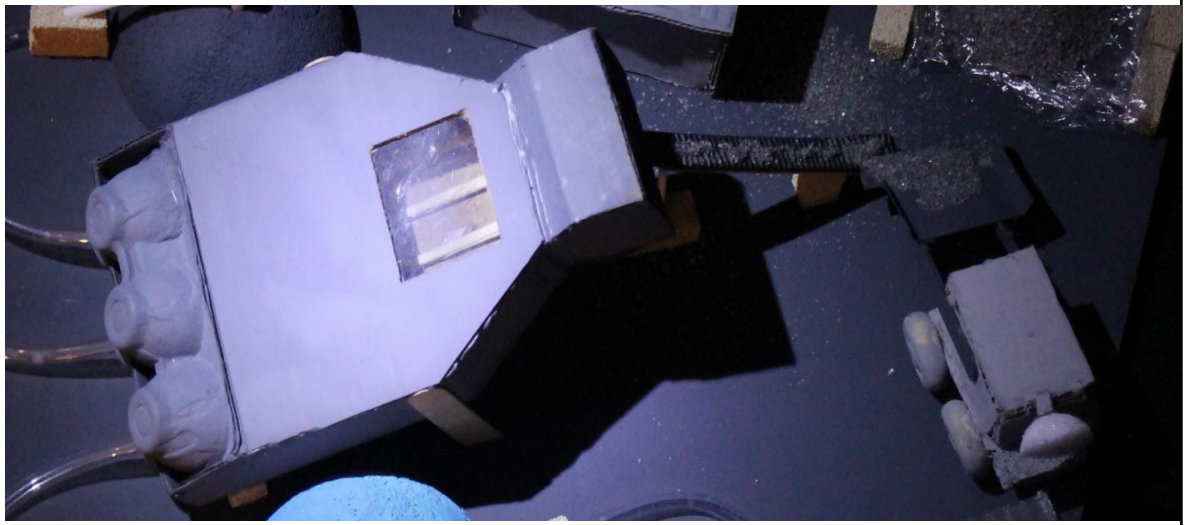


Choose another recycled or reused item and describe how you used it creatively in your model:

Egg cartons were used to represent inflatable storage located in lunar lava tubes. The egg base was removed from the carton and cut into 3” sections. A backing was glued on, and the entire structure was painted metallic gray, and supported using simulated regolith blocks.

Scale: 1”=6’

Example of Scale



Scale used in model (e.g., 1”= 10’, or 1”=22’):

1”=2.5’

Structure 1

What type of structure is this?:

Regolith sorter: Heavy Machine

What size is the structure on the model?:

11.5”

What size would this structure be in real life?:

28.5’

Structure 2

What type of structure is this?:

Rover

What size is the structure on the model?:

5”

What size would this structure be in real life?:

12.5’

Moving Part

URL link to team's moving part video:

https://youtu.be/GuZ3T-8qWhc

Section III

JUDGE ASSESSMENT OF MODEL

Futuristic Technology Example 1

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

Regolith is used to manufacture glass and mirrors for use in solar farms. Microwave technology is used to produce basaltic glass, which is then further processed using technology developed by Molecular Engineers based on Tardigrade organism research, to produce highly efficient, molecularly ordered glass. The glass is then polished and coated, and used in solar farms to produce power across the city.

Scale: 1”=15’

Futuristic Technology Example 2

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

Meteorite and asteroid strikes pose a threat due to lack of atmospheric protection. Electrical and aerospace engineers created specialty aircraft which are equipped with powerful lasers to intercept satellite detected asteroids and use laser beams to vaporize enough to change the asteroid trajectory away from the moon.

Scale: 1”=3’ for bees