

2020-2021 City Model Slideshow

- School/Organization: **Radnor Middle School**
- Educator Name: **Stephen Smolen and Darcy DiGiacomo**
- Future City Team Name: **Eclipsia**



Section I

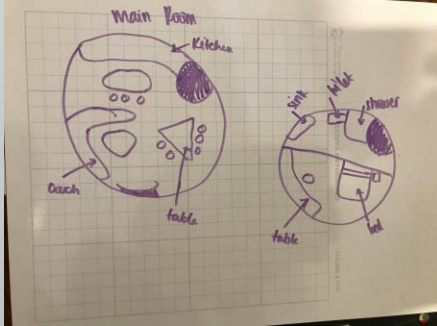
CITY DESIGN

Students who were part of our VirtualTeam created all the virtual designs in SketchUp for Schools.

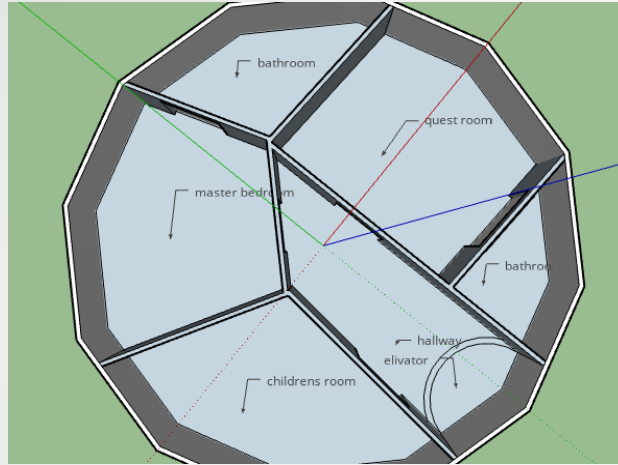
We included their designs as well to illustrate all of their hard work.

Residential Zone

Floor Plan Example



Virtual model of the lower level of a house

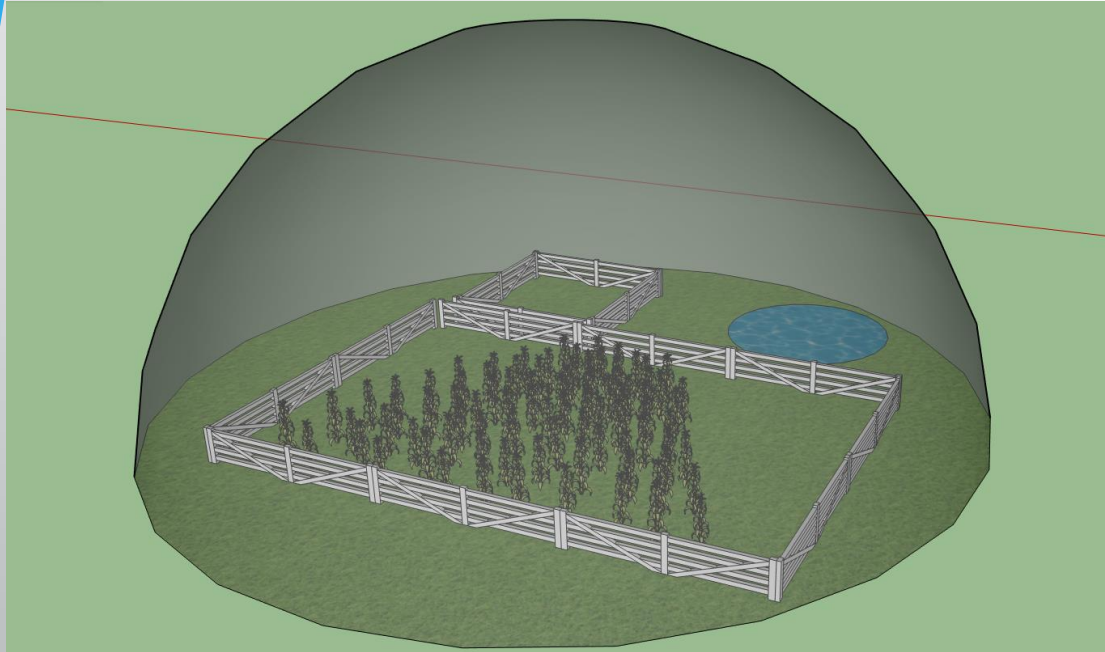


What is important for the judges to know about your residential zone?:

Homes come in three sizes, each with levels. The second level blueprint is shown here. All homes are partially underground. The first floor that is above ground is a clear dome that allows light to come in. This is the main living space with the kitchen, dining room, and living room. The bedrooms are located below ground to ensure darkness for sleeping, even during times of near constant sunlight.



Commercial Zone



This is a dome that contains a farm along with an artificial lake. It also contains an area where livestock can be kept.

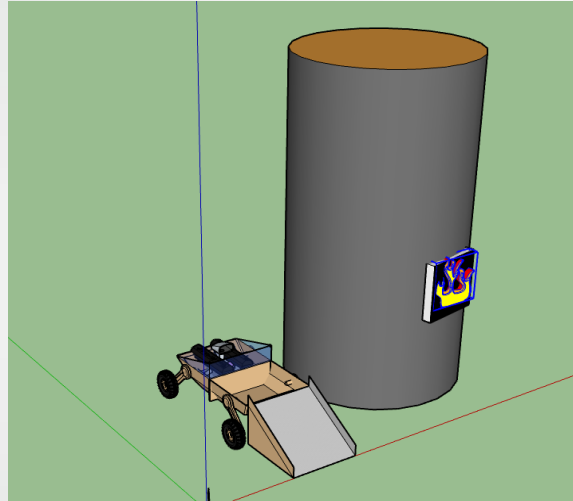
What is important for the judges to know about your commercial zone?:

Eclipsia's commercial zone is the agriculture region of the city. In this zone, both animal and plant farms are fully functional. Eclipsia grows crops using aeroponics, which creates a sustainable method of growing food. During Eclipsia's construction, seeds were sent from Earth and farming began in advance. Now, the city has a self-sufficient farming system. Animals, such as chickens and fish, are raised in above-ground domes with natural light and artificial lakes. These lakes are created using the filtered water from the basin.

Industrial Zone



On the left is a robotic rover that mines for water-ice, lunar dust, and silicon. On the right is the machines that burns biomass.



These are the virtual designs of the models to the left. In the photo, on the left is a rover that mines for water, ice, lunar dust, and silicon, and on the right is a biomass machine.

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

The industrial zone is a hub for mining facilities and energy generating sites. The water-ice is mined by SpaceX robots which started mining months before Eclipsia opened. Other structures in the Industrial Zone are the lunar dust mining facilities. They have a fleet of vehicles to mine and transport lunar dust deposits. The lunar dust is used in cement blocks for the structures in Eclipsia as the dust absorbs radiation. Additionally, the lunar dust contains silicon used for manufacturing solar panels.

Infrastructure Example 1



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

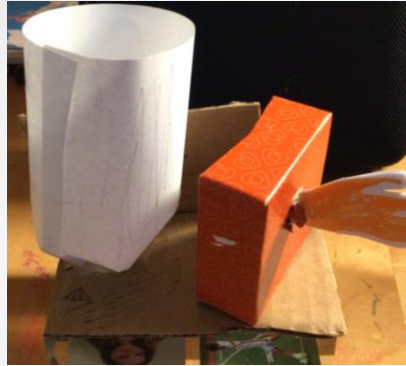
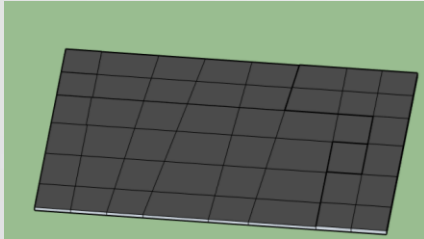
The tunnel system is a part of the infrastructure because it is used to provide a safe, oxygen-filled walking space for residents.

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

This is related to the challenges of living on the moon because on the moon there is no oxygen in the moon's atmosphere. These tunnels allow residents to travel between homes and buildings without carrying bulky oxygen tanks.

Infrastructure Example 2

Solar Panel



Biomass Boiler



Solar panel

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

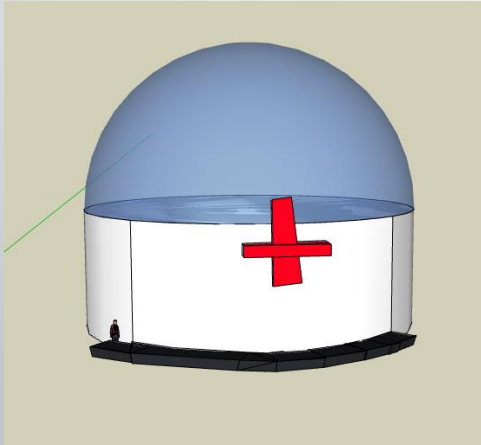
Eclipsia uses a 3-part energy system—solar energy, biomass, and dark energy. Solar panels are used to collect the constant sunlight on the moon, which will then be converted into electricity. High-tech dark energy vacuums are capture dark energy, which accounts for 67% of the universe. This energy is also converted into electricity. Lastly, biomass can be burned to produce thermal and electrical energy.

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

This 3-part energy system accounts for backup sources of power, which will be critical on the moon.

City Services Example 1

Virtual Healthcare Center



Physical Healthcare Center

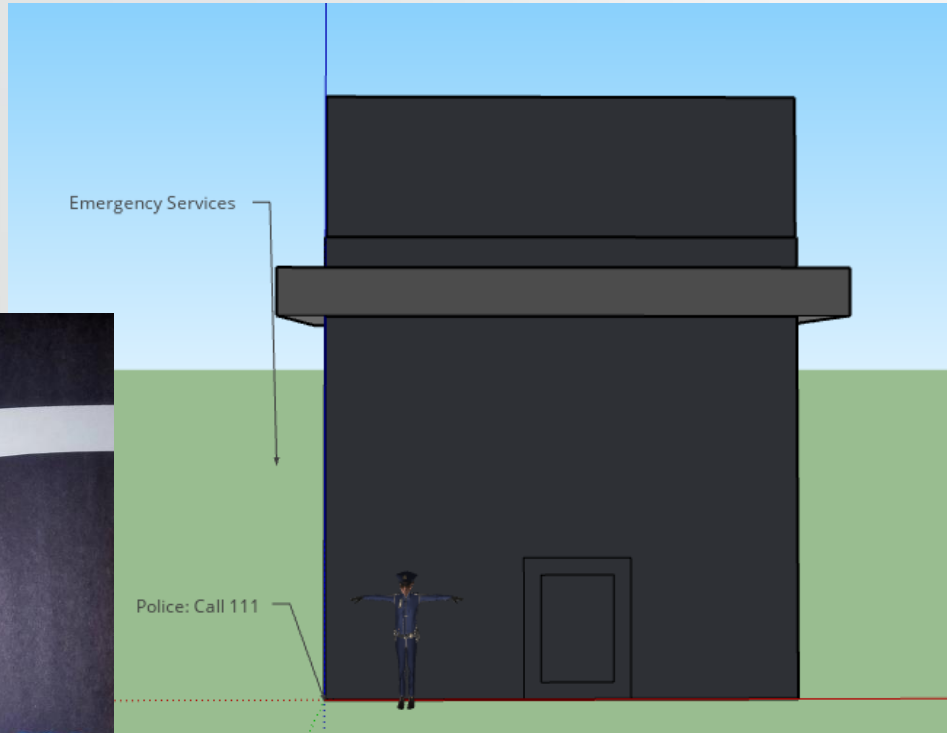
What type(s) of city services are shown here (health, education, etc.)?:

The city has many types of services to keep residents happy and healthy. One of these is specialized lunar healthcare services, including nutritionists.

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

Eclipsia's healthcare facilities have wheelchair accessibility and convenient locations throughout city. All medical centers in Eclipsia have specialized equipment for the lunar environment. There are also trained nutritionists making sure that everyone receives proper nutrients in this new environment

City Services Example 2



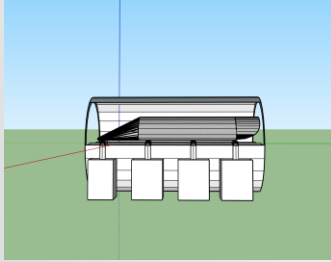
What type(s) of city services are shown here (health, education, etc.)?:

The other type of service the city provides is a police service. This service works alongside the other emergency services to protect residents.

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

In Eclipsia, residents can call the emergency services using the number 111. Policemen and women will be present in the underground walkways and on trains. Officers are ready to protect residents from all forms of danger. Additionally, trained EMTs are on-call at all hours of the day.

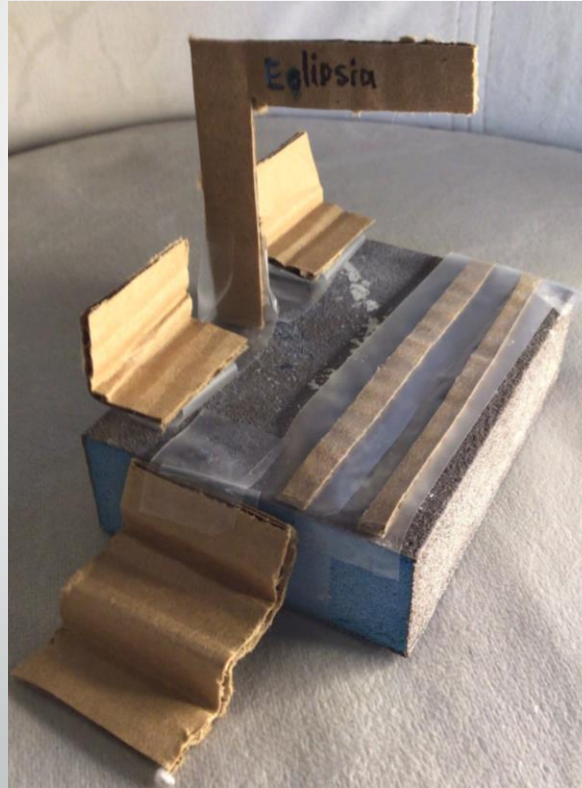
Transportation Example 1



Bullet train



Train Station



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

We have a high-speed bullet train network above ground for long distance transportation and walking tunnels underground for shorter distances. There are also stations that let citizens on and off for easy access.

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

There is a train line for citizens above ground. They are made of strong fiber glass. Buildings that are close to each other are connected by tunnels for shorter distances.

Transportation Example 2



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

Spaceships are used to transport citizens from Earth to the moon or vice versa. Pictured here is a landing station with an air lock.

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

In Eclipsia, spaceships land beneath the surface of the moon. The doors only unlock once the air lock is closed, and oxygen levels are normal to ensure the safety of citizens.

Living on the Moon (Resource #1) Example 1



Identify the Moon resource
shown here:

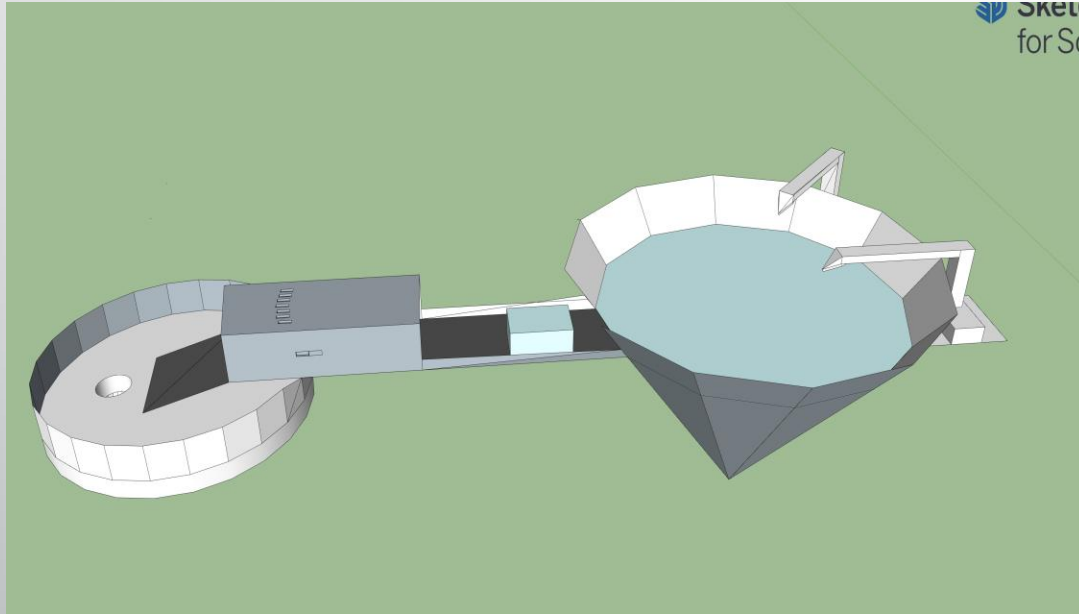
Oxygen

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

Oxygen is the molecule of life
and is important for growing
plants, livestock, and it can also
sustain
people's respiratory system.

Living on the Moon (Resource #1)

Example 2



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

With this contraption, ice from the Lunar South pole is pumped into this container, which is connected to a conveyor belt. It then gets guided into the furnace where turns it into water. This will be transformed into oxygen. This oxygen gets distributed throughout the city and lingers in the atmosphere thanks to the artificial gravity system.

Living on the Moon (Resource #2) Example 1

Lunar Dust Example



Identify the Moon resource
shown here:

Lunar dust

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

Lunar dust consists of many useful materials. For example, silicon is in 20% of lunar dust, which can be used for glass and to build solar cells. Titanium is in 8% of lunar dust, which can be used to manufacture equipment. Because of the useful materials in it, lunar dust is a very important resource.

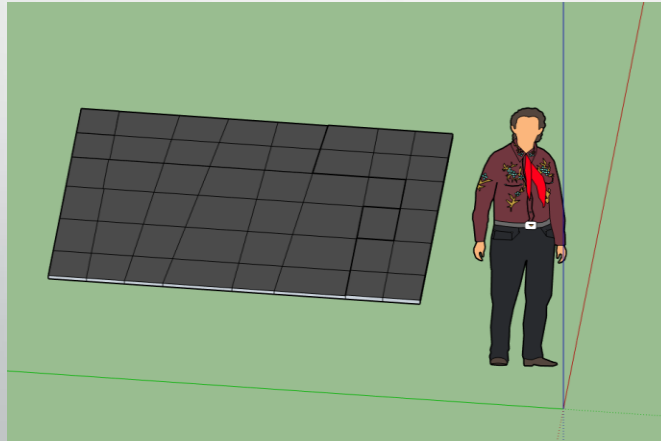
Living on the Moon (Resource #2)

Example 2



Physical Model of a Solar Panel

Virtual Model of a Solar Panel



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

Solar panels

The lunar dust contains silicon which happens to be an important material in solar panels. Having lunar dust as an accessible resource makes solar panels the perfect energy source for a moon-based civilization. The energy is renewable and will never run out, which makes it perfect for life on the moon.

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:

This component uses recycled cardboard in the shape of an octagon to show the shape of the landing dock inside the dome. It also uses recycled fairy lights to make sure that our pod will land safely and securely on the moon and on the dock, so it does not crash and injure the citizens of Eclipsia.

Innovative Material & Use

Example 2



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

This component uses a section of a recycled plastic water bottle, honeycomb detailed paper, and marker to show the contraption that captures dark energy. We shaped these materials into strong collection containers. We chose a thick plastic to represent the thick walls needed to capture dark energy. Once captured, this energy is converted to electricity using a reverse solar cell.

Innovative Material & Use

Example 3



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

In the picture towards the left we used bottle caps, the top of a water bottle and a toothpaste cap to represent some of the homes. The top of the bottle was cut out to show the exterior of the house which is the dome and is the final part that covers the inside parts.

Moving Part

URL link to team's moving part video:

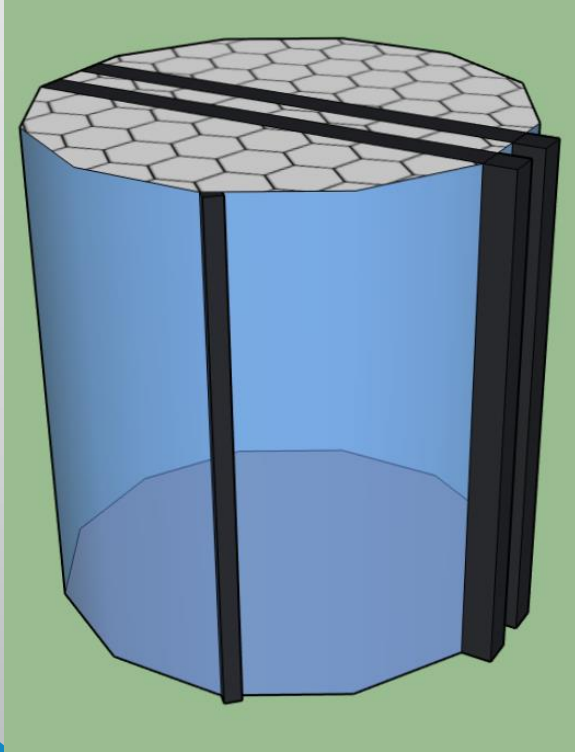
[Moon Rover](#)



Section III

JUDGE ASSESSMENT OF MODEL

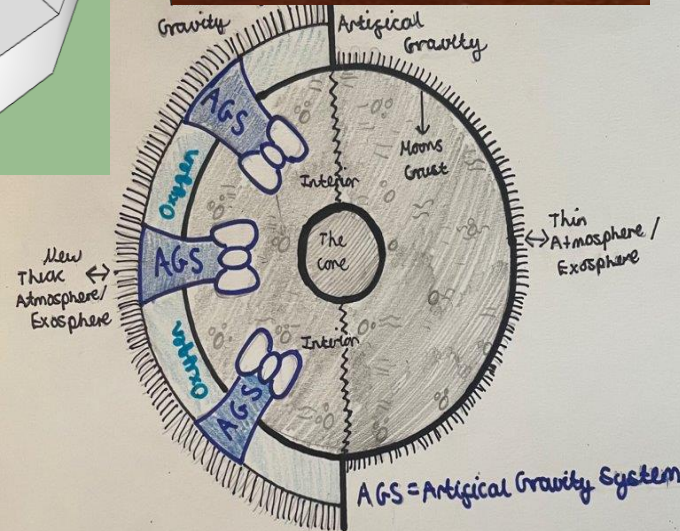
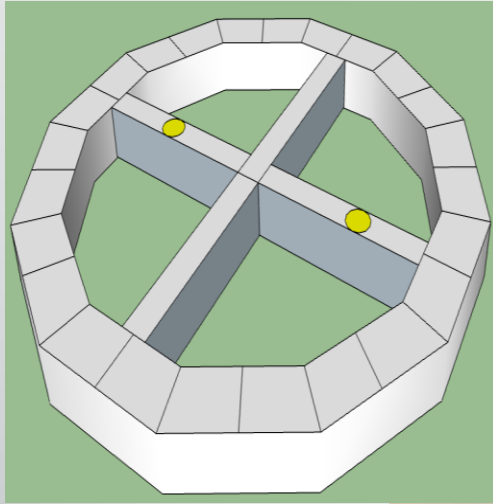
Futuristic Technology Example 1



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

To power Eclipsia, we use 3 energy resources, and one of those energy resources is dark energy. Dark energy is all around us, and it is expanding our universe. In our city, we freeze the dark energy to absolute zero in order to capture it. Then, we process the energy through a reverse solar cell to convert it to electrical energy. Finally, the electricity is transported to our homes and buildings through underground wires.

Futuristic Technology Example 2



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

It's important to incorporate an artificial gravity system because the Moon's atmosphere does not contain oxygen. Additionally, radiation easily cuts through the thin atmosphere. The artificial gravity system will fortify the atmosphere enough to block out harmful radiation and to keep oxygen in the atmosphere.