



2020-2021 City Model Slideshow

School/Organization: **Lionville Middle School**

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Future City Team Name: **Arcollo**

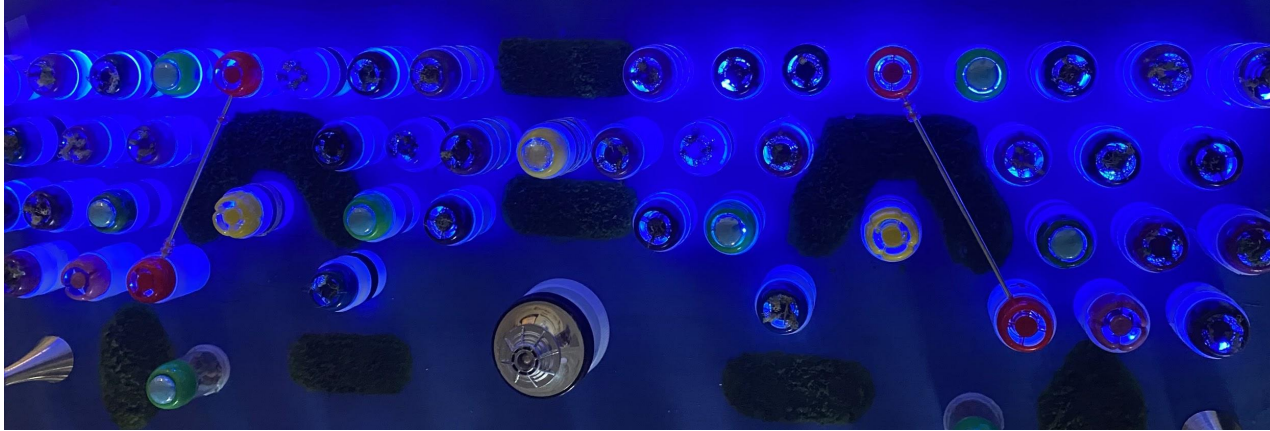
Delete all PURPLE text before submitting the slideshow for judging. Keep text that is black.

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?:

Residential Zones are located inside both Horizontally Oriented Gravity Systems (HOGS), where the 200,000 + residents of Arcollo live. The residential zones alternate with commercial zones in vertical sections inside HOGS. The residential zones are designed futuristically with modular housing, schools, hospitals, and agricultural buildings to maximize limited space inside HOGS. Residential zones are highlighted in blue, with yellow buildings as schools, red as hospitals, blue and purple as housing, and green as agricultural towers. The green turf areas are used for recreation.

Commercial Zone



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

The Commercial Zones alternate with the residential zones and include stores, offices, restaurants, entertainment, and businesses. Aeroponics towers are green in color and hospitals are red in color. The tallest buildings are the multi-level movie theaters, restaurants and low gravity entertainment. The silver structure located in the center is the town hall is the communication HUB and a place where citizens can gather. The commercial and residential alternate to make travel efficient between zones.

Industrial Zone



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

The Industrial Zone of Arcollo is located outside the two HOGS, taking advantage of low gravity manufacturing. It uses diffusion, which allows us to combine immiscible materials that usually cannot be combined. The HOGS are 100% automated and use AI due to the harsher conditions outside of HOGS. Human interaction is required to ensure the Industrial Zones are functioning properly. Sensors, alarms and cameras are used to view the zone and give notice to the HOGS engineers if anything malfunctions. The Industrial Zone is the structure lit up by white lights located in between the two metal cylinders (HOGS).

Infrastructure Example 1



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

The two Horizontally Oriented Gravity Systems (HOGS) inside the lava tube that create gravity and house the residents, providing everything they need to live.

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

One of the challenges of living on the Moon is the lack of gravity. HOGS produces artificial gravity. Our city resides inside these HOGS. The cylinders spin at 377 km per hour. This creates a centrifugal force, pulling our city toward the inside walls of the cylinder. Our citizens feel no sense that they are spinning or sideways because of the scale of HOGS.

Infrastructure Example 2



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

This is the Creation of Oxygen and Water System (COWS). The blue on the top of the Agricultural buildings represent the COWS.

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

The moon has no atmosphere, and therefore no oxygen, let alone a large enough body of water to sustain an entire city. We designed COWS, which is a system that generates oxygen and nitrogen, recycles the carbon dioxide we breathe out, and creates water. COWS does this through a series of advanced chemical processes.

City Services Example 1



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

The red buildings shown here represent Arcollo's healthcare system and the green are agricultural.

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

Healthcare in Arcollo is free and doctors and nurses specialize in moon related conditions, illnesses and work to develop new treatments. Equipment and treatments are readily available in all health centers throughout both residential and commercial zones. Agricultural centers located in both zones provide the necessary nourishment for all citizens.

City Services Example 2



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

Schools in Arcollo, pictured here all have yellow tops. Arcollo education is quite different from Earth, since students will go to regular grade school until 16. They will then switch to a track system where they can focus on one track to pursue such as low gravity engineering or chemical processing. This can be changed any time if the student wishes.

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

Schools encourage students to be creative, and to explore their passions. They learn to take responsibility for the sustainability of the lunar environment.

Transportation Example 1



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

Gyrospheric vehicles are used to transport people and materials into HOGS from Spaceport and from the industrial zones.

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

One of the first issues we had to tackle with HOGS is how we would get inside. We needed a way to comfortably transition people to the new horizontal position and reduce the potential negative effects with no gravity. Our gyrospheres travel down the HOGS axle, which rise to the Spaceport, into the city located along the inner wall of HOGS. Gyrospheres also travel down to collect supplies from the industrial zone.

Transportation Example 2



What type(s) of transportation systems are shown here?:
Arcollo uses bee shaped rocket, hotels, located on the Spaceport, as transportation from the Earth to the Moon.

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

These hotels are powered by splitting water into hydrogen and oxygen and fusing them back together creating a thrust. The interior is powered by solar panels which extend and soak up the Sun's rays. The bee shape makes the hotel aerodynamic, while still having maximum amount of volume possible. The flight takes a total of three days to reach the moon.

Living on the Moon (Resource #1)

Example 1



Identify the Moon resource shown here:

Arcollo's first natural resource is the Peaks of Eternal Light.

Located at Peary Crater region of the moon's North Pole, it collects constant energy from the sun, using 360 degree voltphotaic panels. This is an unusual area where light shines 24 hours a day.

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

Arcollo's energy resource allows for constant energy collection. So sunlight is transferred into electromagnetic energy and transported to Arcollo through transmitters where it reaches Arcollo and provides unlimited energy for the city.

Living on the Moon (Resource #1)

Example 2



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

The solar energy obtained from the Peaks of Eternal Lights's solar panels are sent to Arcollo as a light energy. This is through electromagnetic beam technology, and what we call wireless transmission. As the beam makes its way to Arcollo, there are beam expansion devices along the way that are mounted on poles. It takes in the electromagnetic beam and refocuses it. It eventually reaches Arcollo's power grid where it turns into a direct electrical current and goes on to power our entire city.

Living on the Moon (Resource #2)

Example 1



Identify the Moon resource shown here:

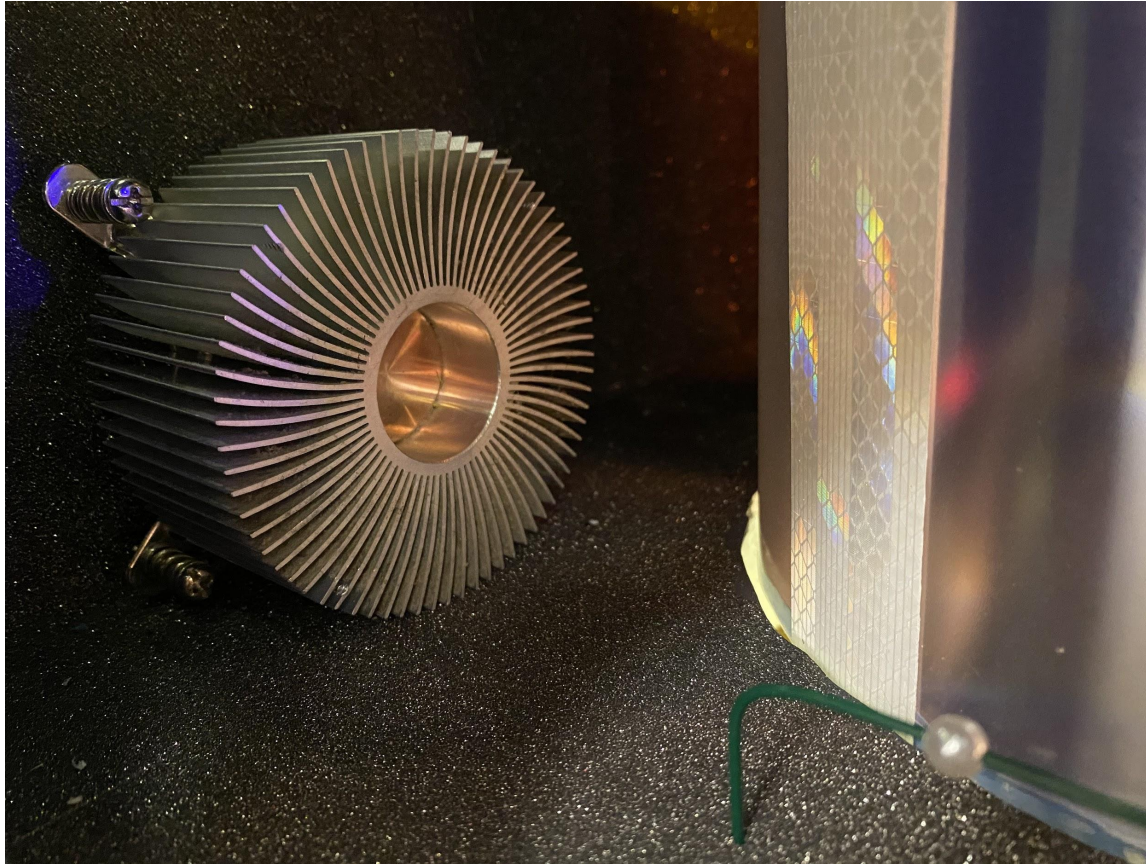
The second moon resource is the lava tubes located underneath the Marius Hills region that house our entire city and supply regolith.

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

This resource encases our city's HOGS and industrial zone and is a natural shield from many of the moon's hazards, such as solar radiation, meteor impacts, drastic temperature fluctuation, adherent moon dust, etc. It also eliminates the need of a bio-dome that would destroy the lunar surface.

Living on the Moon (Resource #2)

Example 2



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

The computer heat sink pictured here represents our regolith mine. We mine regolith inside the lava tubes and extract valuable construction and export materials from it such as titanium, tungsten, aluminum, basalt, silicon, olivine, calcium, and iridium. This regolith can also be combined with urea in a 3:1 ratio to make sturdy bricks, or can be turned into 3D printer filament. It helps create safe, sturdy structures for Arcollo and provides valuable elements to trade with Earth. Located underground also maintains the natural Man on the Moon view from Earth instead of mining on the surface.

Section II

BUILD IT: QUALITY, SCALE, AND MATERIALS

Innovative Material & Use Example 1



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

We collected used tape dispenser rolls over the summer as a team. Since we had so many, we decided to use them to construct our buildings. They are stacked to various heights for the different kinds of services in our city. An advantage of using these, is that they are the perfect transparency for the lights to shine through them. In order to create some variation to the buildings, we topped them off with different colored yogurt pouch caps. This also helps indicate the purpose of each building. It is also 100% recyclable materials.

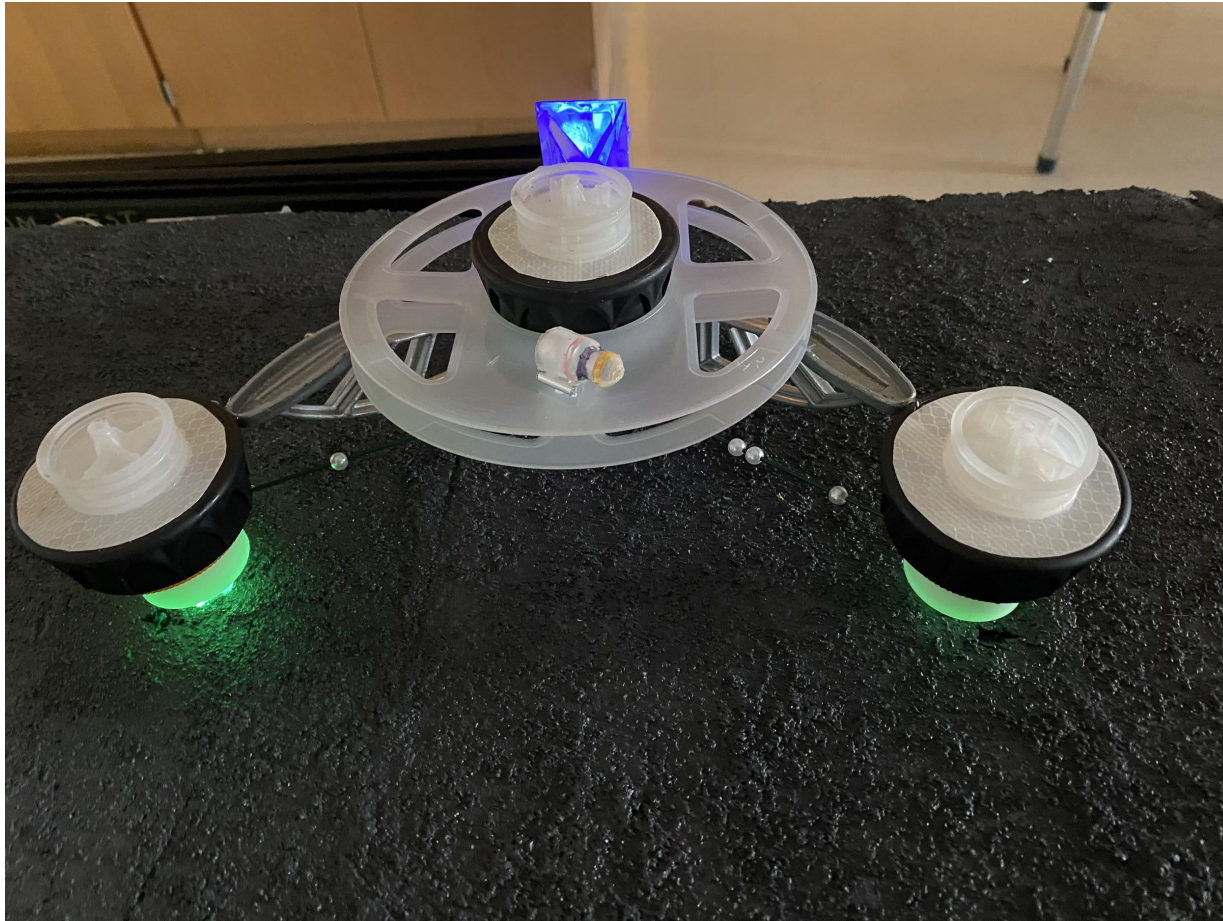
Innovative Material & Use Example 2



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

This is one of the solar panels on the Peaks of Eternal Light, made out of the plastic film from the inside of a flat screen TV. The film is shiny and metallic, making it the perfect material to represent solar panels. When we shine a light on it, it reflects, which mimics the effect of them absorbing sunlight, as they do at the Peaks of Eternal Light. This material is also very thin, and matches the scale of the solar panels. It is very innovative and creative, since many others would not think to use this in their model.

Innovative Material & Use Example 3



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

To create our Spaceport on the surface of the Moon, we used various materials, a few of which were iced tea caps. They are the black caps that indicate the entrance to our HOGS. They are also on the top of the "landing pad" where space hotels dock after landing on the Moon. We attached tape rolls to the bottom of them where the gyroscopes enter to go to the axle of the HOGS. The caps serve as a docking station and entrance to our city. It is innovative to turn a usual cap into one of our main features. Plus, it is a recyclable that we had plenty of since our teacher drinks too much iced tea.

Example of Scale



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

10 centimeters equals 1 kilometer

Structure 1

What type of structure is this?:

This structure is the HOGS Cylinder

What size is the structure on the model?:

Each HOGS is 16 cm tall by 20 cm wide

What size would this structure be in real life?:

Each HOGS would be 1.6 km tall and 2 km wide

Structure 2

What type of structure is this?:

The Industrial Zone between the HOGS

What size is the structure on the model?:

12 cm wide by 12 cm long by 3 cm tall

What size would this structure be in real life?:

1.2 km wide by 1.2 km long by 0.3 km tall

Moving Part

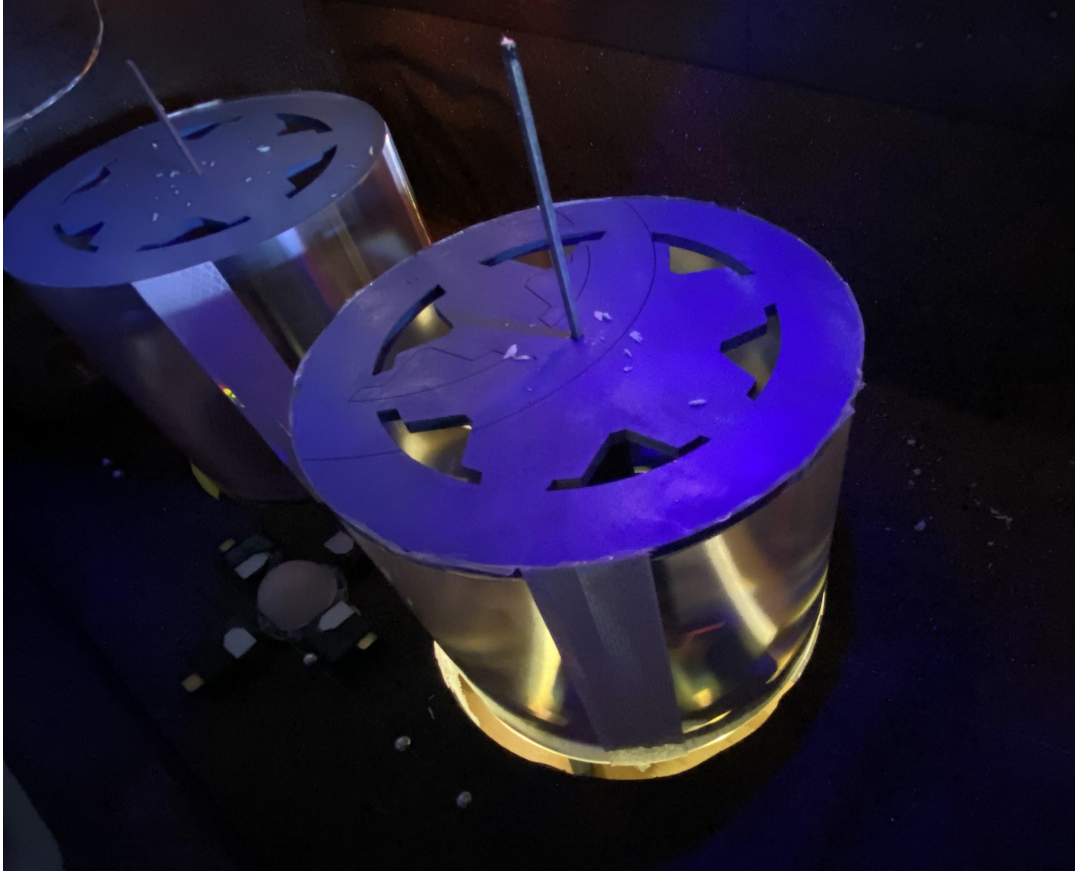
URL link to team's moving part video: HOGS

<https://youtu.be/juUDlgLDFHY>

Section III

JUDGE ASSESSMENT OF MODEL

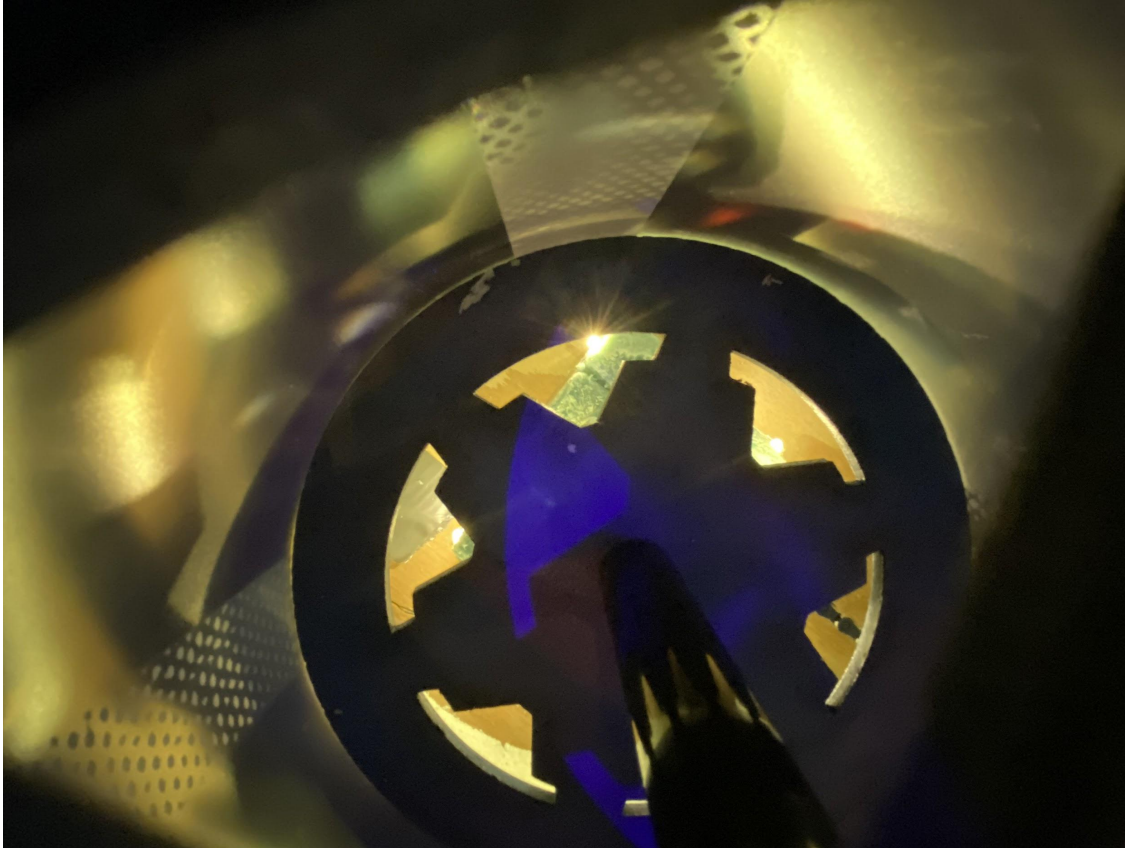
Futuristic Technology Example 1



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

The futuristic technology shown here is the HOGS, the Horizontally Oriented Gravity System. This structure houses our citizens, protecting them with a resilient layer of titanium, aluminum and tungsten to withstand the extreme conditions of the lava tubes. We also provide heat for our citizens by using the friction that the HOGS create by spinning. We distribute the heat throughout HOGS using the Flair Vents. HOGS uses many futuristic processes to uphold Arcollo, including COWS and of course the horizontally positioned city within the HOGS.

Futuristic Technology Example 2



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

Building our city inside an encompassing structure like HOGS means our city has no natural sunlight. But, we quickly found a solution for this using LED lighting coated with a titanium dioxide nanoparticle layer that mimics natural sunlight using Rayleigh scattering. They line the city's ceiling (its axle) and run on a 24 hour clock to keep our Earthling sleep schedules in check. To make up for the lack of Vitamin D, citizens take vitamin supplements.